W. V. CRAME
&
B. BERGER

HANDBOOK OF *Ceco* PRODUCTS

FOR REINFORCED CONCRETE CONSTRUCTION

Ceco PRODUCTS

for

REINFORCED CONCRETE CONSTRUCTION

9th

REVISED EDITION

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PRODUCTS

THIS Handbook is issued to familiarize the Architect, Engineer and Builder with the many advantages of Meyer Steelform Construction, Ceco Reinforcing Bars & Fireproofing Materials.

You will find complete data in this handbook pertaining to the following products:

Other products manufactured by the Ceco Steel Products Corporation, but not included in this handbook:

Ceco Steel Joists
Ceco Metal Weatherstrips
Ceco Metal Frame Screens
Ceco Metal Lathing Materials
Ceco Road Construction Materials
Ceco Steel Windows, Doors and Mechanical Operators

Details and information pertaining to the above products are included in separate handbooks. These will be gladly furnished upon request.

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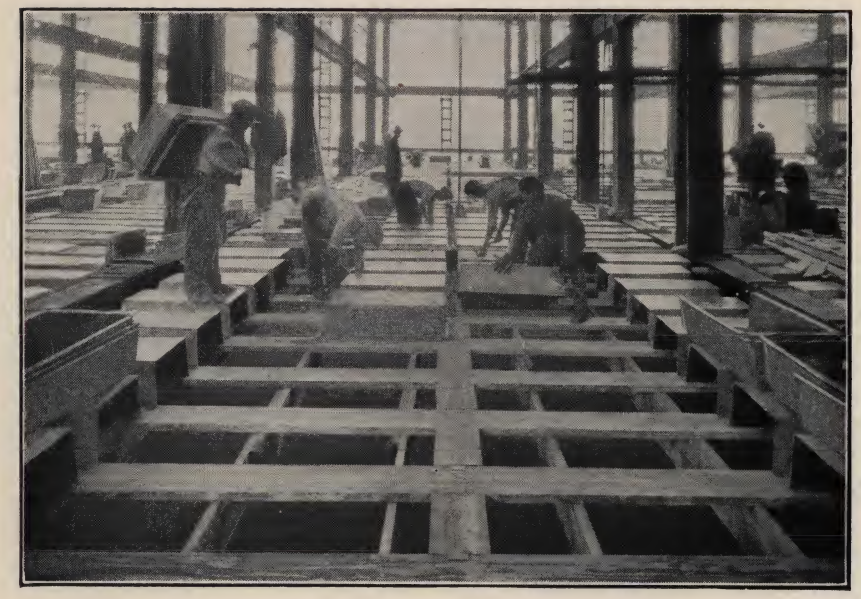


The simple open wood centering used beneath Meyer Steelform Construction is itself an economy. It may be removed and reused with the steelforms from one floor to the next, producing the greatest possible efficiency and economy.

Meyer Steelforms do their work well, for they are made of heavy gauge steel, and are extraordinarily rigid. The work of placing reinforcing bars and concrete proceeds at full speed over the top of the steelforms. The solid rigidity of the steelforms eliminates leakage of concrete and insures accurate execution of structural design.

MEYER
Steelforms

(PATENTED)

MEYER Steelform Construction is a pioneer method of concrete joist construction. First used in 1913 there are now over 200,000,000 square feet of Meyer Steelform Construction in service. Meyer Steelform Construction, in common with other types of concrete joist construction, is most economical for buildings with lighter loads and longer spans, such as store and office buildings, residences, apartments and hotels, schools, hospitals, garages, light manufacturing buildings, etc.

Meyer Steelform Construction in part owes its increasing use year by year to certain theoretical advantages which are inherent in the concrete joist type of construction. Concrete joist construction eliminates much of the concrete below the neutral axis: the concrete below the neutral axis is ineffective and largely wasted due to the weakness of concrete in tension. By the use of concrete joist construction the amount of concrete used is kept to the minimum required for any given condition of spans and live loads, and the consequent saving in dead load has its economical effect on all parts of the structure.

In addition to the theoretical economies of all types of concrete joist construction, the concrete joists and thin slab between the joists constituting Meyer Steelform Construction are formed with cores or fillers of heavy gauge *removable* steelforms supported on a skeleton centering. When the concrete has set, the steelforms are removed and re-used many times, thus permitting a nominal rental charge for each use.

Meyer Steelforms are handled on a rental basis only, and are leased to contractors and owners for use on specific work. Ordinarily the labor of placing and removing the steelforms by our skilled workmen is included with the rental charge. The economy of the re-use of Meyer Steelforms, on a rental basis, is readily apparent.

Meyer Steelforms have been developed along the lines of simplicity and practicability; the open wood centering required is probably the simplest and most economical required for any kind of concrete floor construction. The steelforms are made of 16 gauge and 14 gauge steel, strong and sufficiently rigid to support all construction loads.

To help in the preparation of designs and estimates, and in the execution of every contract is the organization of salesmen, engineers, and building craftsmen who represent the Ceco Steel Products Corporation.

There are two Standard Types of Meyer Removable Steelforms, namely Meyer Flange Type Steelforms with nailing flanges, and Meyer Adjustable Steelforms without flanges, and nailed to the formwork through the sides of the forms.

Meyer Flange Type Steelforms

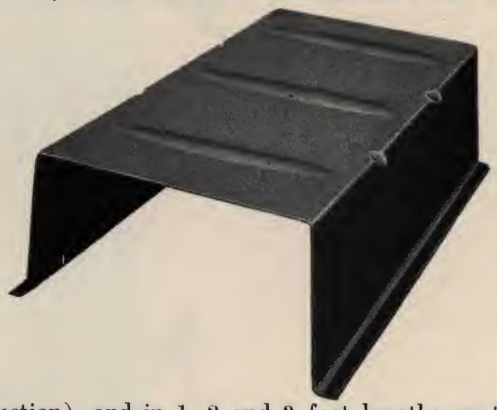
In building the formwork for concrete joist construction contractors agree that the joist sides and the soffits of the thin slabs between the joists are most economically formed by means of steelforms, whereas the supporting formwork can best be framed with wood joist soffits, supporting wood ledgers, and adjustable shores or wood up-rights. Meyer Flange Type Steelforms have, therefore, been designed and developed with the thought that they are essentially a part of the centering. A comparison of the relative merits and economy of Meyer Flange Type Steelforms with other concrete joist forms must take into consideration the cost of the supporting formwork. A study of the supporting formwork details on Page 6 is suggested.

All forms are made of 16 gauge steel. Additional strength is secured either by means of depressed ribs in the top surface or by means of 1″ x 5/8″ x 1/8″ angles riveted to the under side. All the usual construction loads are thereby carried safely and there is no loss of concrete.

Continuous joists are produced by lapping the intermediate steelforms, and the ends of the rows of steelforms are closed with endforms. Steelforms are of convenient length and weight for handling, and are nailed through holes in the 1 inch flanges into the joist soffits by men working on top of the open centering.

Intermediate Forms

The standard intermediate steelforms are furnished in 6″, 8″, 10″, 12″ and 14″ depths, and in 20″ widths, (in accordance with U. S. Department of Commerce Simplified Practice Recommendation R.87-32, Forms for Concrete Ribbed Floor Construction), and in 1, 2 and 3 foot lengths, so that any length of span can be handled without undue lapping of the forms.



Endforms

Endforms for Meyer Flange Type Steelform construction are also furnished in 6″, 8″, 10″, 12″ and 14″ depths, and 20″ widths, and are of three types—Straight, Single Tapered, and Double Tapered. They are all used to close the rows formed with intermediate steelforms.

a. Straight Endforms are used where the load is such that the same width of joist can be maintained throughout its entire length. Straight endforms are also used to form bridging or header joists and to block out for pipes and for electrical conduits and outlets.

b. Single Tapered Endforms effect a gradual increase in the width of the joist as it approaches the support, thus providing an increased cross section of the joist where the shear is greatest. Where the concrete joists are continuous this increased cross section is also needed for the negative compression at the supports. The amount of the taper is 2″ in the 3′ length of the endforms. A limited supply of single tapered ends is available with a taper of 4″.

c. Double Tapered Endforms provide the same increase in the width of the joists as do the Single Tapered Ends, and in addition provide a compression flange or tee for the supporting beam or girder. The amount of the taper in plan view is 2″, and in elevation is 3″ in the 3′ length of the endforms.

The Standard Single and Double Tapered Endforms ordinarily produce a sufficient widening of the joists at the supports to take care of the shear and compression due to negative moment occurring there, but for extreme cases requiring additional widening of the joists, we have devised our Meyer Cantilever Endforms. Meyer Cantilever Ends are 1′ in length, and are designed to be used always in conjunction with standard Tapered Endforms. The Cantilever Endforms are lapped slightly over the closed end of the Single or Double Tapered Ends and thus produce a larger, wider taper on the joist. (See details page 4). The length of the taper then becomes 4 feet and the width of the joist and the thickness of the tee are increased accordingly.

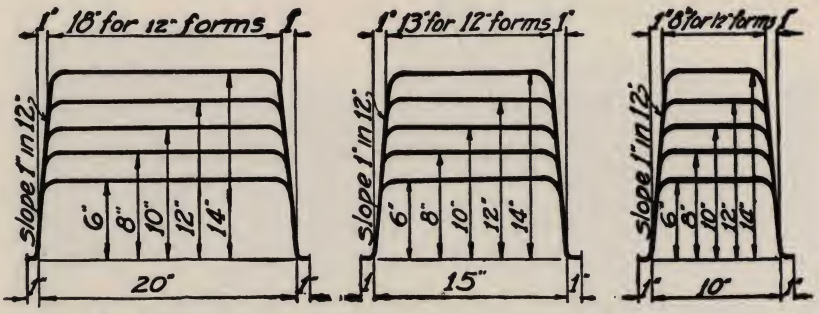
Despite the necessary increase in the width of the concrete joists at the supports obtained by the use of tapered endforms, it is a distinctive feature of Meyer Flange Type Steelforms that the open centering is in no way complicated. The overall width of the nailing flanges of both the Single and Double Tapered Ends is the same at both the narrowed and the 20 inch wide end, namely 22 inches, and the width between the nail holes is always 21 inches, exactly the same as the distance between the nail holes in the intermediates. Thus a 2″x6″ soffit if accurately set can be used for 6 inch wide joists as the distance between nail holes across the joist would be 5 inches.

Special Widths

Besides the standard width of 20 inches, Meyer Flange Type Steelforms are available in 10 inch and 15 inch special widths, (in accordance with U. S. Department of Commerce Simplified Practice Recommendation R. 87-32, Forms for Concrete Ribbed Floor Construction). All endforms for the special widths are 1 foot long Straight Endforms. It is not the intention that whole areas be laid out using these widths, as the supply is limited, but they are provided so as to complete a panel where the space remaining would not permit the use of a 20 inch standard width steelform. In this way joists may be so spaced as to eliminate almost entirely the waste concrete in joists made uselessly wide, beyond the needs of the design, to fill out a panel.

Sizes of Meyer Flange Type Steelforms

INTERMEDIATES

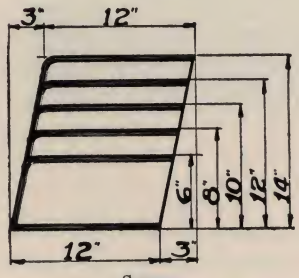


STANDARD SPECIAL

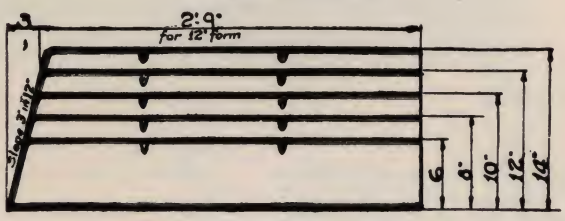
Standard Intermediate Steelforms furnished in 1, 2, and 3-foot lengths.

Special Intermediate Steelforms furnished only in 3-foot lengths.

ENDFORMS



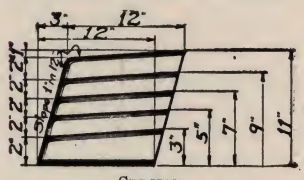
SPECIAL
Cantilever Endforms for use with Single Tapered Endforms



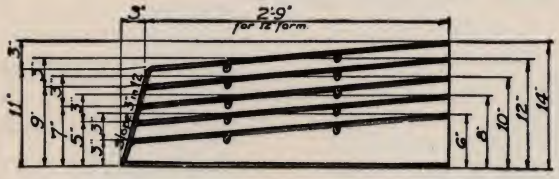
SINGLE TAPERED ENDFORMS

Straight Endforms furnished only in 1-foot lengths, 10, 15, and 20 inches wide.

Tapered Endforms furnished only in 3-foot lengths, 20 inches wide at open end.

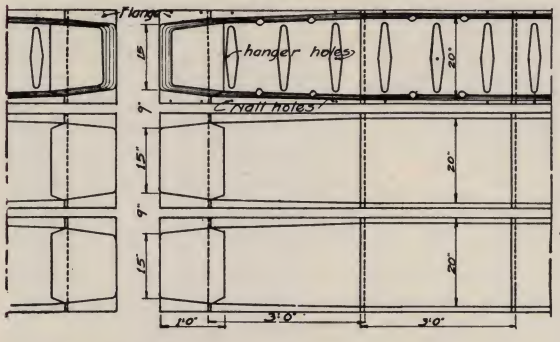


SPECIAL
Cantilever Endforms for use with Double Tapered Endforms

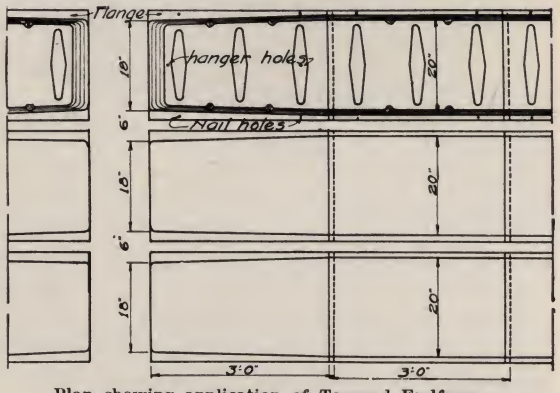


DOUBLE TAPERED ENDFORMS

Cantilever Endforms furnished for use in connection with all sizes of Tapered Endforms.



Plan showing application of Cantilever Endforms in conjunction with Tapered Endforms



Plan showing application of Tapered Endforms
A limited supply of single tapered ends is available with a taper of 4".

30" Wide Meyer Steelforms

The standard type of Meyer Steelforms as described above is also available in 30-inch widths. The details of the stiffening ribs, the nailing flanges, the side batter of the forms, and the lengths of the intermediates and endforms are all exactly the same as for the 20-inch wide steel forms; only in that the single tapered end forms narrow from 30 inches to 25 inches in the 3 feet, is there any variation from the details of the 20-inch wide steelforms shown above.

Estimating Data for Meyer Flange Type Steelform Construction

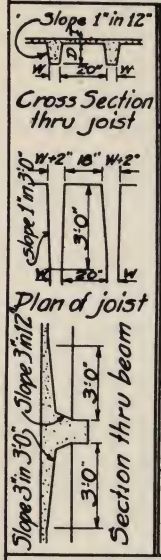
Meyer Steelform Construction is a combination of concrete joists and thin slabs. In computing the amount of concrete in the floor construction of a building designed for Meyer Steelforms it is more convenient, and there is less chance for error, to multiply the floor area by the equivalent thickness of the floor construction than to separately figure the concrete in the joists by multiplying the lineal feet of joists by their unit of volume and adding thereto the concrete in the thin slabs.

The cubic feet of concrete per square foot of floor (or roof) area of Meyer Steelform Construction, is a function of the thickness of the thin slab, the depth of the joists, and the width and spacing of the joists. The additional concrete in the joists at their ends as formed by Single and Double Tapered Endforms cannot be pro-rated on a square foot basis. The concrete added to the joists by the tapered endforms must be figured per lineal foot of beam or wall into which the joists frame, and this unit of volume must be multiplied by the number of lineal feet of beams and walls along which the tapered endforms are set, to determine the total amount of concrete added by the use of the tapered endforms.

For convenience in estimating, an arrangement in tabular form of the quantities of concrete required for Meyer Flange Type Steelform Construction, is given on this page. In this connection it is well to bear in mind that the strength of the 16 gauge metal of which Meyer Steelforms are made and the skillfully placed stiffening ribs and corner depressions, permit sharp angles in the steelforms and an absolutely flat top, thus requiring a minimum of concrete. These tables should, therefore, not be used in computing the concrete for other types of metal form construction.

TABLE FOR ESTIMATING QUANTITIES OF CONCRETE
Required with Meyer 16 gauge removable steelforms

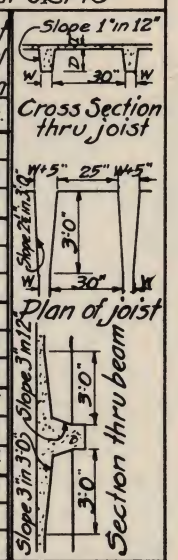
FOR 20" WIDE STEELFORMS



Depth of S.F. "D"	Width of joist "W"	cubic feet of concrete per square ft. floor T=2"	T=2½"	T=3"	cubic feet per lineal foot beam S.T.E.	D.T.E.
6"	4"	.262	.304	.346	.08	.36
	5"	.279	.321	.363	.08	.35
	6"	.293	.335	.377	.08	.34
8"	4"	.298	.340	.382	.12	.39
	5"	.320	.362	.404	.12	.37
	6"	.339	.381	.423	.11	.36
10"	4"	.336	.378	.420	.16	.42
	5"	.363	.405	.447	.16	.40
	6"	.387	.429	.471	.15	.39
12"	4"	.377	.419	.461	.21	.46
	5"	.408	.450	.492	.20	.44
	6"	.437	.479	.521	.20	.42
14"	4"	.420	.462	.504	.26	.49
	5"	.456	.498	.540	.25	.48
	6"	.490	.532	.574	.24	.46

FOR 30" WIDE STEELFORMS

Depth of S.F. "D"	Width of joist "W"	cubic feet of concrete per square ft. floor T=2½"	T=3"	T=3½"	cubic feet per lineal foot beam S.T.E.	D.T.E.
6"	5"	.293	.334	.374	.13	.41
	6"	.304	.346	.387	.13	.40
	7"	.315	.357	.398	.13	.39
8"	5"	.322	.364	.405	.18	.46
	6"	.338	.380	.421	.18	.44
	7"	.351	.392	.434	.17	.43
10"	5"	.353	.395	.436	.24	.51
	6"	.372	.414	.455	.23	.50
	7"	.389	.430	.472	.23	.48
12"	5"	.386	.427	.469	.30	.57
	6"	.408	.450	.491	.30	.56
	7"	.430	.470	.512	.29	.54
14"	5"	.420	.460	.493	.37	.63
	6"	.447	.488	.530	.36	.61
	7"	.470	.511	.553	.35	.60



Amount of concrete given for single and double tapered end forms is for one side of beam only

S.F. = steel form S.T.E. = single tapered end D.T.E. = double tapered end ft. = foot

Formwork Details for Use with Meyer Flange Type Steelforms

We are here illustrating various types of open wood centering used to support Meyer Steelforms. Each type has been found most economical for certain conditions. For purposes of comparison the details in each case illustrate a wall bearing building with interior beams and columns. In order that comparisons as to the amount of lumber used for each design may be readily made, the joist spans have been assumed at 22'-0" clear between the beam and the wall, and 20'-0" center to center of the columns supporting the interior beams, and with a clear story height of 12'-0" between floors. Ten-inch deep steelforms are shown with 4-inch joists, 24" centre to centre. In each case there is listed the number of board feet of lumber required for the area 22'-0" by 20'-0". The quantities given are in all cases exclusive of lumber used for bracing, scab blocks, wedges, sills and waste.

The results arrived at for the particular problem illustrated must be used with care in adapting the designs shown to any specific building, as the lay-outs have been prepared as suggestions of ideas rather than as iron clad limits for the sizes and spacings of the wood members. The dead weight of the concrete to be supported, which varies with the joist depths and widths, the joist and beam spans and the story heights all affect the form work design. And further, if the panel shown were supported by beams on both sides instead of with a wall as one bearing, one line of wood joists and posts could be eliminated, as the ends of the joist soffit boards would then be carried on the beam sides.

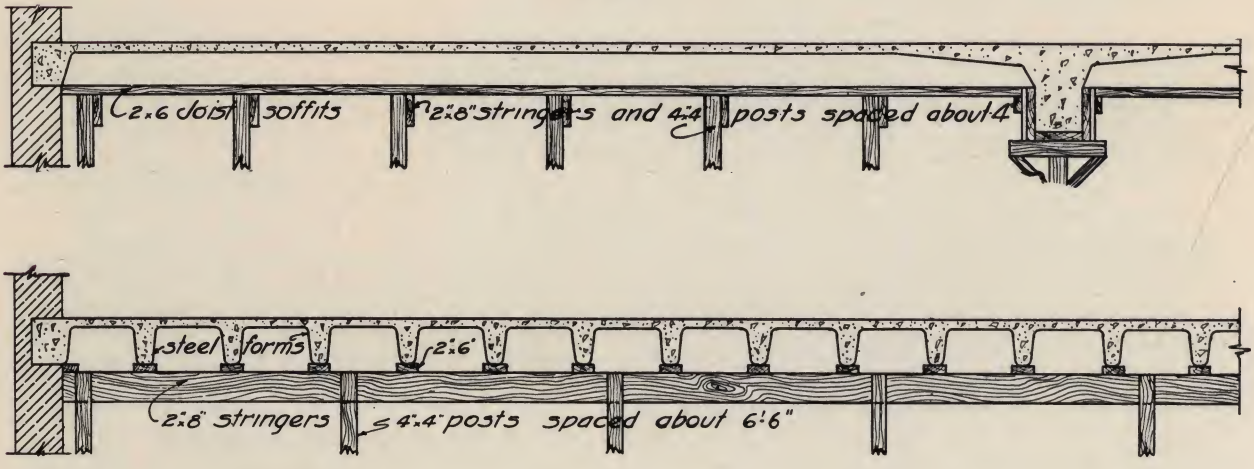
Attention is called to the Single Tapered Endforms and the Double Tapered Endforms, both Meyer Steelform features. The 2" x 6" joist soffits remain exactly the same at the ends when tapered endforms are used as when straight endforms are used. Due to the design of the nailing flange, it is not necessary to provide triangular strips on the sides of the joist soffits where Tapered Endforms are used. Double Tapered Endforms eliminate the necessity for continuous soffit pieces along the sides of the beams for the concrete Tee.

It is notable that in no case is it necessary to accurately rip the soffit boards to the exact width of the joist, nor is it necessary to space them with extreme accuracy.

Meyer Adjustable Shores may be used with economy in place of the 4"x4" uprights.

Attention is particularly called to Type 2 which illustrates a device permitting the early removal of the form work, and which may be adapted for use with any kind of open wood centering for Meyer Steelform Construction.

Type 1



This is the most generally used of all types of open wood centering devised for Meyer Steelform Construction. The centering requires a minimum of lumber and is easily erected and removed. All material is standard 2" or 4" dimension lumber, requires little nailing, and has, therefore, a high salvage value.

The material required for the 20'-0" x 22'-0" panel is as follows:

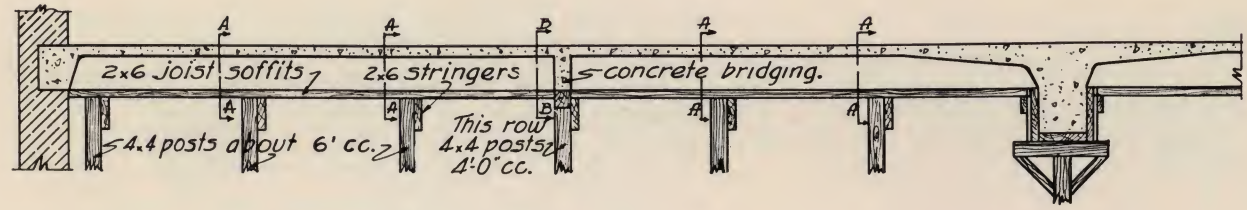
10 joist soffits	2"x 6"x 22'-0"	220 Bd. Ft.
6 joists	2"x 8"x 20'-0"	160 Bd. Ft.
18 posts	4"x 4"x 12'-0"	288 Bd. Ft.
TOTAL for 440 square feet,		668 Bd. Ft.

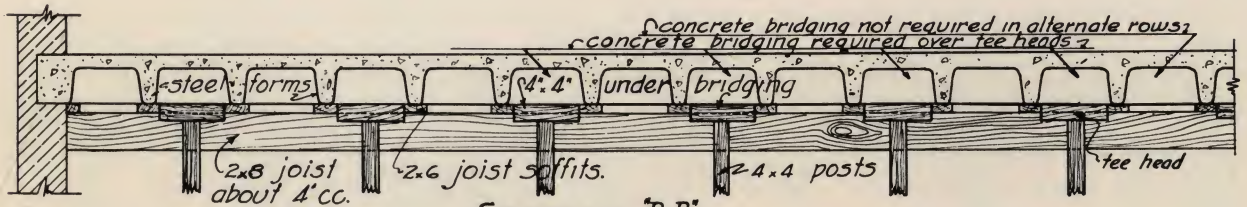
or 1.52 board feet per square foot.

If the panel were supported by beams on both sides the 2" x 8" joist and the 4" x 4" posts along the wall would be eliminated as the ends of the soffit boards would be carried on the beam sides, and the amount of the lumber required would then be 1.35 board feet per square foot. Approximately the same percentage of reduction is possible in the centering quantities given for Types 2 and 3, following, if the panel is considered as supported by beams on both sides.

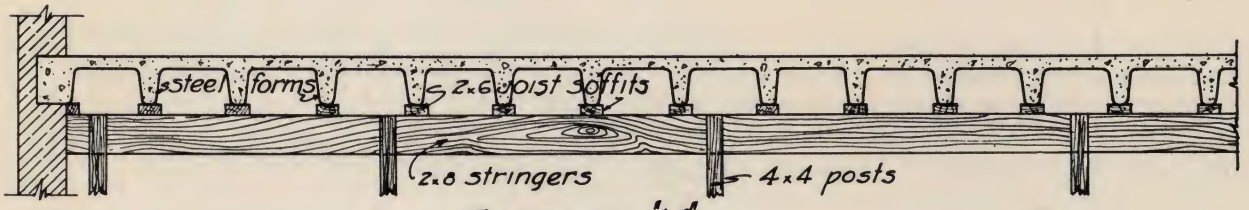
This detail shows the 2" x 8"'s nailed to the side of the 4" x 4" uprights, but they are sometimes placed directly on top of the posts.

Type 2





SECTION "BB"



SECTION "AA"

Ordinarily in the construction of wall bearing buildings the furnishing of only one floor of form lumber is sufficient. After a floor has been poured, the concrete has time to set; and the forms may be removed and made ready for re-use, all while the walls are being laid for the next story. In skeleton construction the erection of the frame may proceed so rapidly that three floors of form work, if built as shown in Type 1, are required.

A type of centering has therefore been devised which permits the removal of all the forms in normal weather in three or four days after the pouring of the concrete. This construction necessitates the introduction of some bridging joists (providing they are not already called for by the design) directly beneath which are placed 4" x 4" uprights. The number of uprights to remain in position depends upon the length of the joist span, and the speed with which it is necessary to wreck the remainder of the form work. Most of the 4" x 4" uprights are removed when the centering is wrecked, and the 4" x 4" uprights remain in place only under the bridging joists.

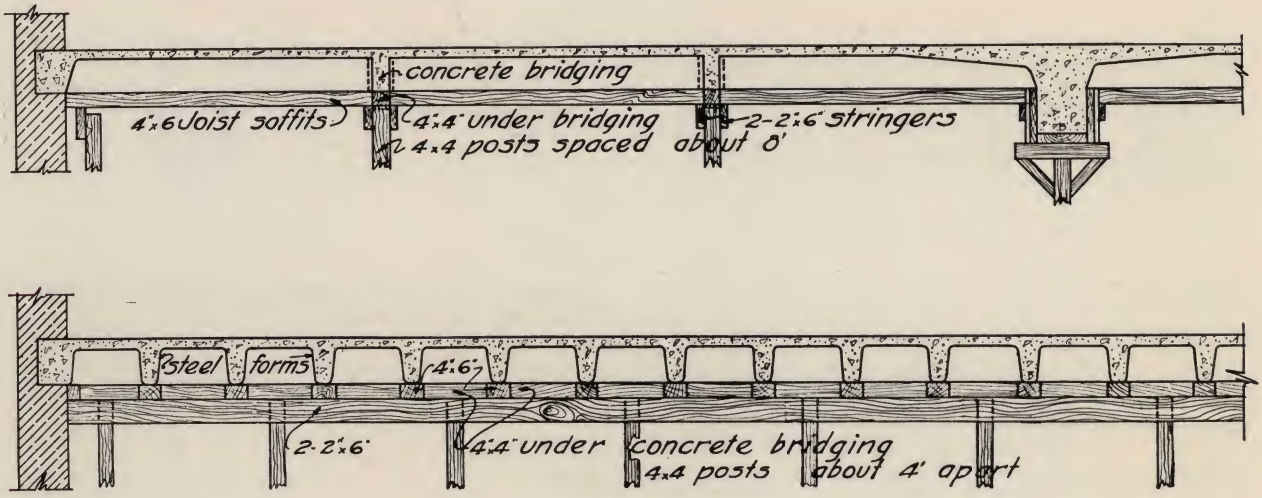
In this problem we have designed the centering so that the joists are temporarily supported at the middle, which in good weather would permit the removal of the forms in a few days. This centering requires a little more lumber than Type 1, and in addition there is the concrete in the bridging joists, but, in those buildings having two or more floors, and in which the floors are poured in rapid succession, the saving of a floor or more of form lumber and Meyer Steelforms required will, all things considered, provide the most economical centering possible for any kind of concrete floor construction.

While this illustration adapts the form of centering shown in Type 1, the principal may be used with any other kind of centering for Meyer Steelforms. It will be noted that Type 3 is a special case of the same general principle.

The material required for the 20'-0" x 22'-0" panel is as follows:

10 joist soffits	2"x 6"x 22'-0"	220 Bd. Ft.
6 joists	2"x 8"x 20'-0"	160 Bd. Ft.
20 posts	4"x 4"x 12'-0"	320 Bd. Ft.
5 cross pieces on posts	4"x 4"x 1'-8"	11 Bd. Ft.
	TOTAL for 440 square feet,	711 Bd. Ft.
	or 1.62 board feet per square foot.	

Type 3



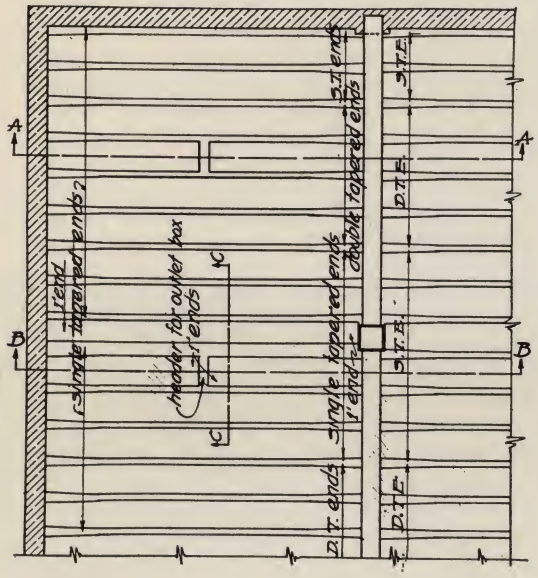
Where the design requires concrete bridging between the joists another type of centering is in use which permits the rapid wrecking of all the formwork. In erecting the forms the uprights are placed directly beneath the bridging joists, and the centering is so designed that all the remainder of the forms may be removed without disturbing the uprights. Each concrete joist is then temporarily supported about every seven feet so that the removal of all horizontal shoring can be safely done in a few days, the exact time depending upon the weather. Thus in the construction of a skeleton building it will be easily possible to make equal speed with one less floor of Meyer Steelforms and form lumber.

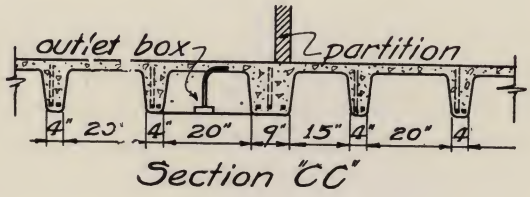
The material required for the 20′ 0″ x 22′ 0″ panel is as follows:

10	joist soffits	6″x 4″x 22′-0″—440 Bd. Ft.
4	joists	2″x 6″x 20′-0″— 80 Bd. Ft.
1	joist	2″x 8″x 20′-0″— 26 Bd. Ft.
13	posts	4″x 4″x 12′-0″—208 Bd. Ft.
10	crosspieces on posts	4″x 4″x 1′-8″— 22 Bd. Ft.

TOTAL for 440 square feet, 776 Bd. Ft.
or 1.75 board feet per square foot.

Construction Details





Section "CC"

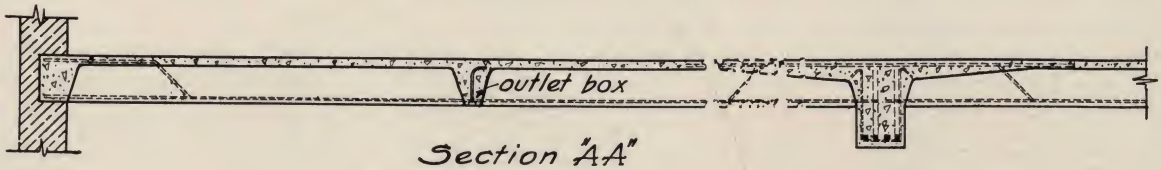
Sections A-A, B-B, and C-C are cross-sections through typical Meyer Steelform Construction.

Double Tapered Endforms provide an efficient method of securing a Tee on a concrete beam to resist the compressive stress. The stem of the beam can satisfactorily resist the compressive stress near the end of the span without the aid of a Tee, but toward the center of the beam span additional concrete area in the form of a Tee is nearly always required. The plan shown on this page together with Sections A-A and B-B indicate an economical solution of the problem in a practical manner by the use of Double and Single Tapered Endforms. In this way Double Tapered Endforms are used only where they are absolutely necessary. Where Tees are formed by holding back Single Tapered Endforms from the sides of the beams it is necessary to provide a continuous soffit board on each side of the beam, the necessity for which is done away with by using Double Tapered Endforms.

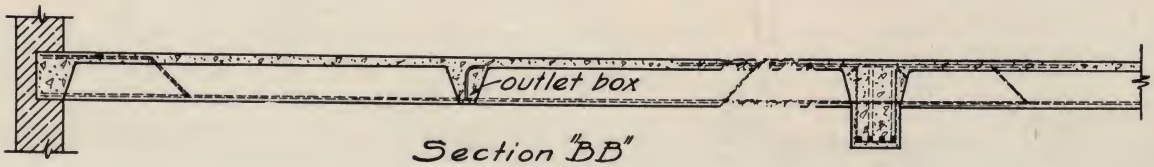
Building codes and architect's specifications now generally provide that outlet boxes for electric fixtures and for other openings shall be kept out of the concrete joists, as these boxes displace the joist steel. Headers between the joists for the accommodation of outlet boxes are quickly formed in a workmanlike manner by the introduction of one foot straight endforms, all as shown in the sections.

Under partitions it is often necessary to provide joists of extra strength. To bring the joist directly beneath the partition it is sometimes necessary to resort to special width steelforms to secure the proper spacing, all as shown in Section C-C.

While the details on this page are illustrated by the use of 20" wide steelforms, they apply equally in the use of 20" and 30" wide steelforms of the adjustable type.



Section "AA"



Section "BB"

Meyer Adjustable Type Steelforms

Stores and office buildings, hotels and apartments, public buildings, schools and hospitals, clubs and fraternal buildings are in nearly all cases finished with plastered walls and ceilings, and for buildings where plastered ceilings are used, Meyer Flange Type Steelforms are ordinarily most satisfactory and most economical. On the other hand there is a class of buildings where neatly finished concrete surfaces are much more appropriate than plastering. Warehouses, light manufacturing buildings, and garages fall in this class. For exposed or open ceiling work of this kind Meyer Adjustable Steelforms have been designed and developed. Because of the neat concrete joists produced with Meyer Adjustable Steelforms there has also been a growing tendency to omit ceiling plastering in buildings of the finished type, particularly in schools and apartments, and to decorate directly on the concrete joists. In this way it has been possible to secure fireproof construction at the cost of non-fireproof construction.

Meyer Adjustable Steelforms are so called because one set of forms will yield any depth of concrete joist from 6″ to 14″. The steelforms are slipped in between and nailed to the sides of the wood joist soffits. Vertical rows of three sixteenths inch nail holes are provided in the sides of each form and the depth overall is 16″, so that joists 6″, 8″, 10″, 12″ and 14″ in depth may be obtained. Double headed nails should be used to facilitate removing the forms but no auxiliary struts, braces or spreaders are required.

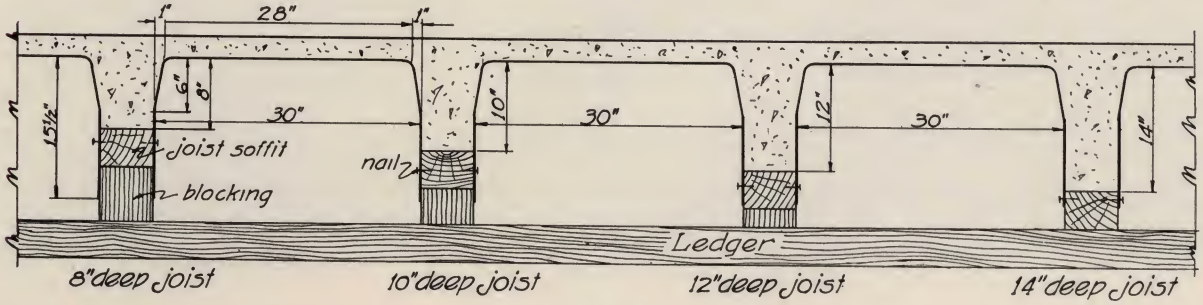
Meyer Adjustable Steelforms are made of 14 gauge steel, and are rendered absolutely rigid by the use of small angles riveted to the underside.

These stiffener angles are used on the 30″ wide forms only.

Three-sixteenths inch holes are provided in the top of all steelforms for the reception of hangers to support metal lath ceilings beneath.

Meyer Adjustable Steelforms may be removed without wrecking any of the supporting wood centering, usually within 48 hours, and thus can be used to advantage where frequent and rapid re-use is required. The rapidity of removal and re-use, combined with the flexibility as to depth, reduces the amount of steelforms required to construct a building to a minimum.

As stated above, Meyer Adjustable Steelforms are particularly recommended for buildings with

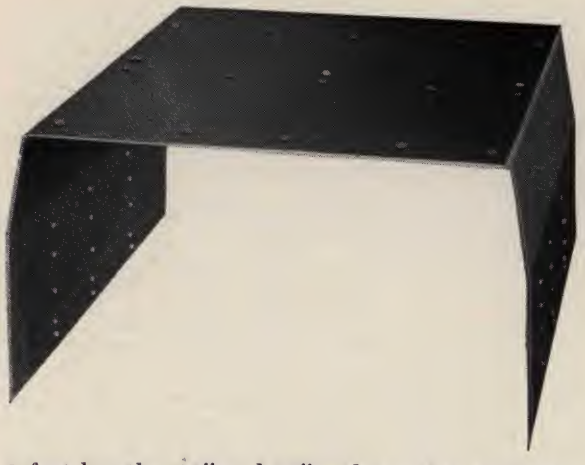


unplastered ceilings. The resulting joists are absolutely straight, and with a uniform width. The joists are clean cut in appearance, and the spacing of joists, approximately 6″ wide, at 36″ centers is pleasing to the eye, and presents a workmanlike job.

Meyer Adjustable Steelform construction is such that the flexibility as to the depth of joists, and the fact that the steelforms may be removed without disturbing the supporting formwork, has been attained without rendering that supporting formwork complicated or expensive. The centering required is of a skeleton character, very simple, and with a high salvage value. It is recommended that the designer use concrete joists widths such as 5½″ and 7½″ corresponding to the widths of lumber used for joist soffits.

Intermediates

Standard width intermediates are furnished 20″ and 30″ wide, and in 1, 2, and 3 foot lengths. Special width intermediates are furnished in 1 and



3 foot lengths, 15″ and 10″ wide, so that any spacing of joists can be effected without extra wood centering.

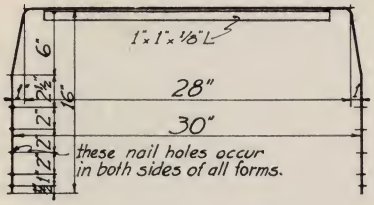
Endforms

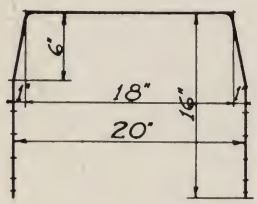
Endforms are of two types: Straight Endforms and Tapered Endforms. They are both used to close the rows of intermediate steelforms. Straight Endforms are used where the load is such that the same width of joist can be maintained throughout the span between supports. Tapered Endforms effect a gradual increase in the width of the joist as it approaches the support, thus providing, in the most economical manner, the necessary additional concrete where the shear is greatest, and where it is needed for negative compression at the supports. Wedge shaped strips must be provided on the joist soffit pieces to conform to the narrowing of the Tapered Endforms. A compression flange or tee on the supporting beam or girder may be provided with a minimum of concrete and without

additional centering by tilting the endforms downward toward the support.

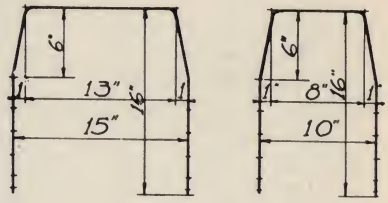
Standard width endforms, both straight and tapered, are furnished 30″ wide and 3′-0″ long. In addition endforms 30″ wide and 1′-0″ long, without taper, are provided, and are used to close the rows of steelforms to form bridging joists and headers for light outlets. Tapered Endforms are 30″ wide at the open end and narrow to 26″ at the closed end at the support, thus providing an increase in the width of the joist of 4″ at the support. Endforms 20″, 15″, and 10″ wide to close the rows of intermediates of the same widths are made 3′-0″ long, straight without tapering.

Sizes of Meyer Adjustable Steelforms





Standard Widths

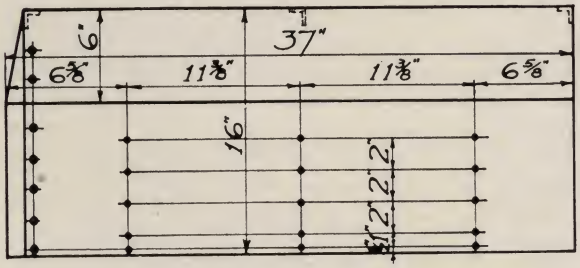


Special Widths

Adjustable to 6", 8", 10", 12" and 14" Depths

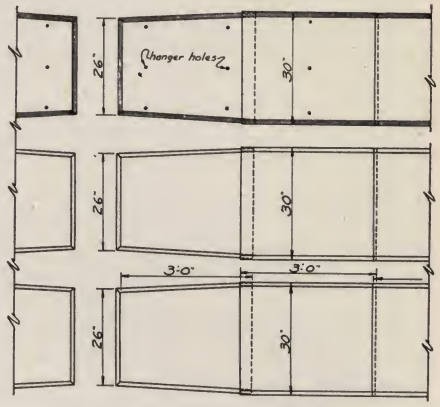
30" wide *Standard* Width Intermediate Steelforms are furnished in 1, 2, and 3-foot lengths.

20", 15" and 10" wide steelforms are *Special* Width Steelforms. The intermediates are furnished in 1 and 3-foot lengths.



3'0" Endforms

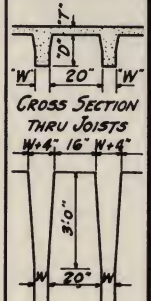
Elevation of a 3'-0" endform. Tapered Endforms 3'0" long are furnished for 30" and 20" wide steelforms. Straight Endforms 1'-0" or 3'-0" long are furnished for the 30" and 20" standard widths and the 15" and 10" special widths.



Plan showing application of tapered endforms.

TABLE FOR ESTIMATING QUANTITIES OF CONCRETE REQUIRED WITH MEYER ADJUSTABLE STEELFORMS

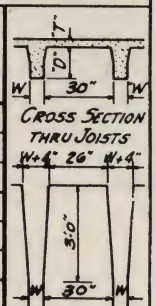
FOR 20" WIDE STEELFORMS



Depth of S.F. "D"	Width of Joist "W"	Cubic feet of Concrete per square foot of floor. T-2"	T-2½"	T-3"	S.T.E.
6"	3½"	.262	.304	.345	.141
	4½"	.279	.321	.362	.135
	5½"	.295	.337	.378	.130
8"	3½"	.289	.329	.370	.183
	4½"	.309	.350	.393	.176
	5½"	.331	.372	.414	.170
10"	3½"	.312	.353	.395	.226
	4½"	.340	.381	.424	.217
	5½"	.367	.408	.450	.209
12"	3½"	.336	.378	.420	.268
	4½"	.371	.412	.455	.258
	5½"	.403	.444	.486	.248
14"	3½"	.361	.403	.444	.312
	4½"	.402	.443	.485	.299
	5½"	.438	.480	.522	.287

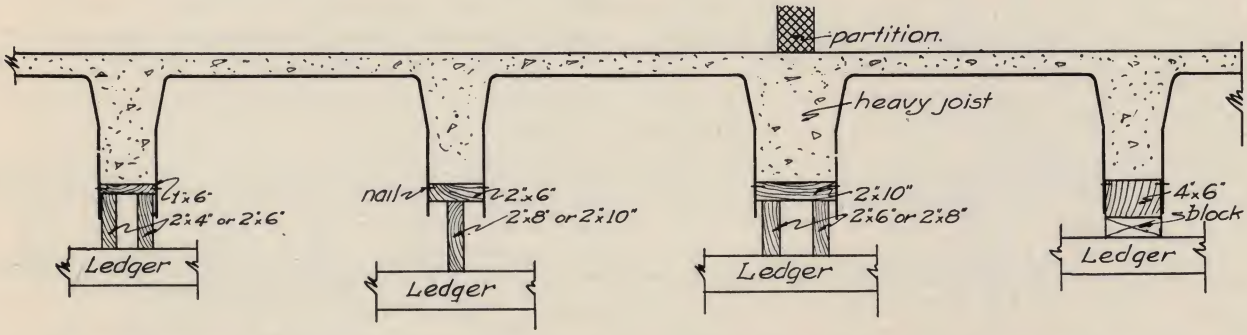
FOR 30" WIDE STEELFORMS

Depth of S.F. "D"	Width of Joist "W"	Cubic feet of Concrete per square foot of floor. T-2½"	T-3"	T-3½"	S.T.E.
6"	5½"	.300	.341	.383	.099
	6½"	.311	.353	.395	.097
	7½"	.322	.364	.406	.094
8"	5½"	.326	.368	.408	.127
	6½"	.341	.383	.424	.124
	7½"	.355	.397	.438	.121
10"	5½"	.352	.394	.434	.156
	6½"	.371	.413	.454	.152
	7½"	.389	.430	.472	.148
12"	5½"	.378	.420	.461	.183
	6½"	.401	.443	.484	.178
	7½"	.422	.464	.505	.174
14"	5½"	.404	.446	.486	.212
	6½"	.430	.472	.514	.206
	7½"	.456	.497	.539	.201



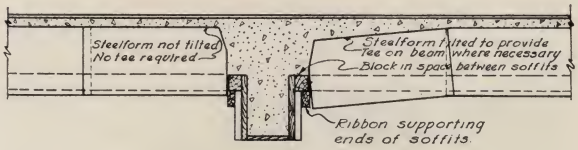
S.T.E. is an abbreviation for single tapered endform. Figures shown in table under this heading indicate the cubic feet of concrete per lineal foot of bearing along which tapered endforms are used.

Centering Details for Meyer Adjustable Steelform Construction



Meyer Adjustable Steelform construction lends itself to a variety of economical methods of building the supporting skeleton formwork. The availability of the lumber, the amount of the re-use of the form lumber, its salvage value, all affect the kind of centering to be selected. The drawing at the top of this page illustrates some of the types of centering used on important work. The kind of joist soffit used of course affects the spacing of the supporting ledgers and uprights.

To the right is a sketch showing an important detail in connection with the use of Meyer Adjustable Steelform construction. This drawing shows the tilting of the endforms to provide a Tee on the beams without wasting concrete and without additional centering. When cross ledgers support the joist soffits it is necessary to maintain a minimum clear distance between the lower edge of the steelform and the ledger, of 2", in order to facilitate the removal of the steelform. In the centering details for the 20′ 0″ x 20′ 0″ panel below a 4″ x 6″ x 1′ 0″ piece is indicated as the necessary blocking. However the use of Meyer Adjustable Shores or other uprights directly under each joist soffit and the elimination of the cross ledgers removes the necessity for such blocking.



Centering Details for 20′ 0″ by 20′ 0″ Panel

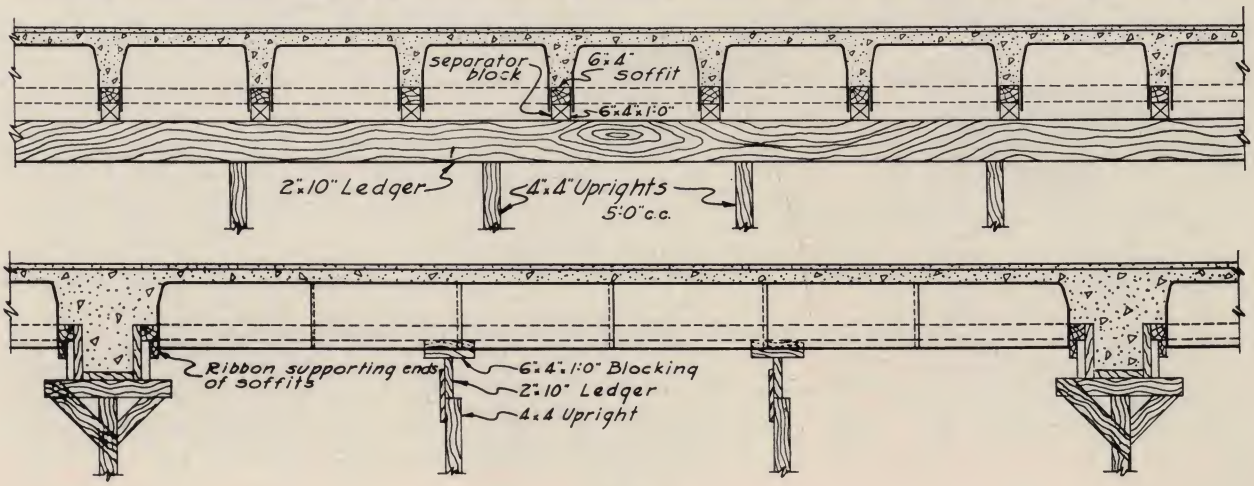
As an illustration of the economical centering required with this construction we have designed the centering for a typical panel 20′-0″ clear between beams and 20′-0″ between columns. 10″ deep steelforms are shown with 5½″ joists 35½″ c.c., and the material required is as follows:

7 joist soffits.....6″x 4″x 20′-0″—280 Bd. Ft.
2 cross ledgers.....2″x 10″x 20′-0″— 73 Bd. Ft.
8 uprights .....4″x 4″x 10′-0″—107 Bd. Ft.
2 ribbons on beam sides..2″x 4″x 20′-0″— 27 Bd. Ft.
14 separator blocks.....6″x 4″x 1′-0″— 28 Bd. Ft.

515 Bd. Ft.
1.24 Bd. Ft. per Sq. Ft.

The quantities given are exclusive of bracing, scab blocks, wedges, sills and waste.

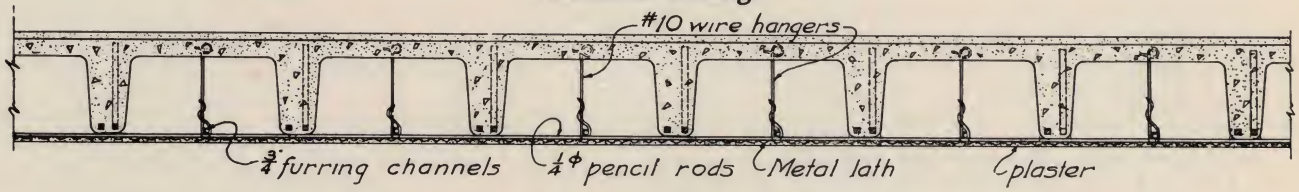
Meyer Adjustable Shores may be used with economy in place of the 4″ x 4″ uprights.



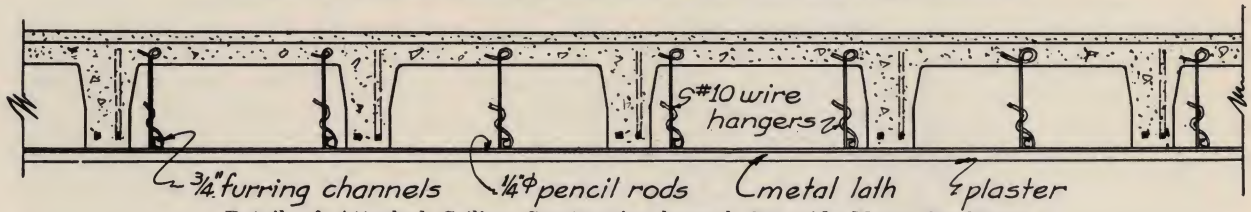
Ceiling Constructions

Although open joist ceilings without plastering are often specified for warehouses, factories, garages, and similar buildings, plastered ceilings are generally required for other buildings. To provide a flat base for the plaster, a metal lath ceiling has been found most satisfactory. Ceilings may be attached directly to the under side of the joist construction or suspended any distance.

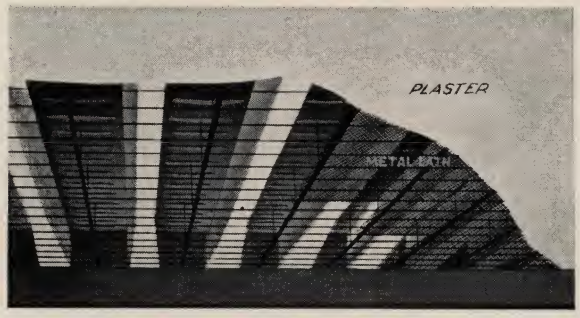
Attached Ceilings



Details of Attached Ceiling Construction beneath 20" wide Meyer Steelforms.



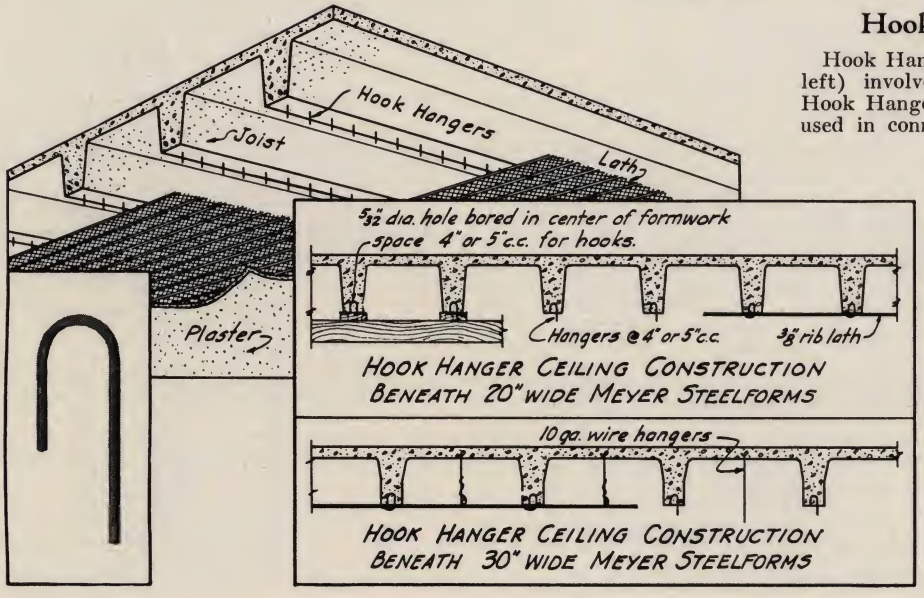
Detail of Attached Ceiling Construction beneath 30" wide Meyer Steelforms.



Our Standard Attached Ceiling Constructions (above) used in connection with 20" wide and 30" wide steelform construction involves the use of galvanized wire hangers, steel furring channels, ¼" round steel pencil rods and metal lath. This construction may be brought tight up against the bottom of the joists or suspended as much as 6 inches. Many millions of yards of this ceiling have been erected: it possesses great strength and permanence. The ceiling is erected after the removal of the steelforms, and can be leveled up, straight and true, despite any variation in the level of the floor construction, without filling out with plaster afterwards. The concrete and plaster do not come in contact.

This type of ceiling construction may be dropped a short distance below the bottom of the joists in order to conceal automatic sprinkler pipes or other conduits. The specifications for this type of ceiling are shown on page 19.

Hook Hanger Ceilings



Hook Hanger Ceiling Construction (at left) involves the use of special Ceco Hook Hangers and a ⅜" rib lath when used in connection with 20" wide steelform construction. When used in connection with 30" wide steelform construction the use of 10-gauge galvanized wire hangers and ¾" furring channels is also necessary to assure maximum rigidity. This construction provides a most economical lath ceiling, is strong and rigid, but must be brought up tight against the bottom of the joists. The elimination of channels, hangers, and pencil rods effects an economy in material and labor. The specifications for this type of ceiling are shown on page 19.

Specifications

Meyer Flange Type Steelforms

The floor construction in general to be Meyer Steelform Construction, in accordance with the design and practice of the Ceco Steel Products Corporation. This construction involves the use of removable Steelforms in the floor slabs, forming a slab and joist construction, the Steelforms to be placed upon open wood centering. Steelforms shall remain in place for a period of seven days after the pouring of concrete (except that forms may be removed quicker where special centering such as shown on page 11 is provided) and shall be removed only upon notification of the architect or engineer. Severe weather conditions may necessitate leaving the Steelforms in place for a longer period of time. Temporary braces, or supports shall be erected after the removal of Steelforms to properly support the floor construction until the concrete has thoroughly set.

The Steelforms shall be manufactured of No. 16 gauge sheet steel and shall have depressed ribs in the top surface or stiffened with small angles to effect the necessary rigidity. They shall be provided with nail-holes along the lower flanges to permit nailing the open wood centering, and shall have 3/16″ round openings in the center of the top surface of each Steelform to receive wire hangers for the lath ceilings when attached directly beneath the concrete joists.

Meyer Adjustable Type Steelforms

The floor construction in general to be Meyer Adjustable Steelform construction, in accordance with the design and practice of the Ceco Steel Products Corporation. This construction involves the use of removable Steelforms in the floor slabs, forming a slab and joist construction, the Steelforms being nailed through the sides to open wood centering.

The Steelforms shall be manufactured of No. 14 gauge sheet steel and shall be stiffened with small angles riveted to the top surface. They shall be provided with 3/16″ holes in their sides for nailing into the joist soffits, and with 3/16″ holes in the top surface of each steelform to receive wire hangers for the lath ceilings when such ceilings are attached directly beneath the concrete joists.

Attached Ceilings

Beneath 20″ Wide Meyer Steelforms

With 20″ wide Steelform construction where lath is to be applied directly against the bottom of concrete joists, or suspended a distance of not exceeding 6″ below the joists, place No. 10 gauge soft galvanized wire hangers through the top surface of each steelform at 3′ center to center, providing a loop in each hanger to engage the concrete. ¾″ Ceco hot or cold rolled channels shall be then erected running parallel to and between the rows of joists, cross furred with ¼″ round steel pencil rods at 13½″ center to center running transversely to the joists and furring channels. Ceco metal lath shall then be applied, using 18-gauge soft galvanized wire.

Beneath 30″ Wide Meyer Steelforms

With 30″ wide steelform construction where lath is to be applied directly against the bottom of concrete joists or suspended a distance not exceeding 6″ below the joists, place No. 10-gauge soft galvanized wire hangers in the center of the top surface of each steelform in every other row of steelforms. In alternating rows place two 10-gauge soft galvanized wire hangers in the top surface of each steelform an inch from each side, in holes which have been provided. (See detail preceding page.) ¾″ Ceco hot or cold rolled channels shall then be erected running parallel to and between the rows of joists at approximately 24″ center to center cross furred with ¼″ round steel pencil rods at 13½″ centers running transversely to the joists and the furring channels. Ceco metal lath shall then be applied, using 18-gauge soft galvanized wire.

Suspended Ceilings

Beneath 20″ Wide Meyer Steelforms

Where lath ceilings are to be suspended a greater distance than 6″ from the concrete joists, place ¼″ round mild steel hangers at 4′ center to center in alternating rows of concrete joists through holes bored in wood centering, with a loop in the hanger to engage the concrete. 1½″ Ceco hot or cold rolled carrying channels shall then be erected at 4′ center to center parallel to the joists and cross furred with ¾″ Ceco hot or cold rolled channels running at 13½″ center to center transversely with the carrying channels, all tying to be done with 14-gauge soft galvanized wire. Lath shall then be applied using 18-gauge soft galvanized wire.

Beneath 30″ Wide Meyer Steelforms

Where lath ceilings are to be suspended a greater distance than 6″ from the concrete joists, place ¼″ round mild steel hangers at 4′ center to center in each row of joists. 1½″ Ceco hot or cold rolled carrying channels shall then be erected at 3′ center to center parallel to the joists and cross furred with ¾″ Ceco hot or cold rolled channels running 13½″ center to center transversely with the carrying channels, all tying to be done with 14-gauge soft galvanized wire. Lath shall then be applied using 18-gauge soft galvanized wire.

Ceco Hook Hanger Ceiling Construction

Beneath 20″ Wide Meyer Steelforms

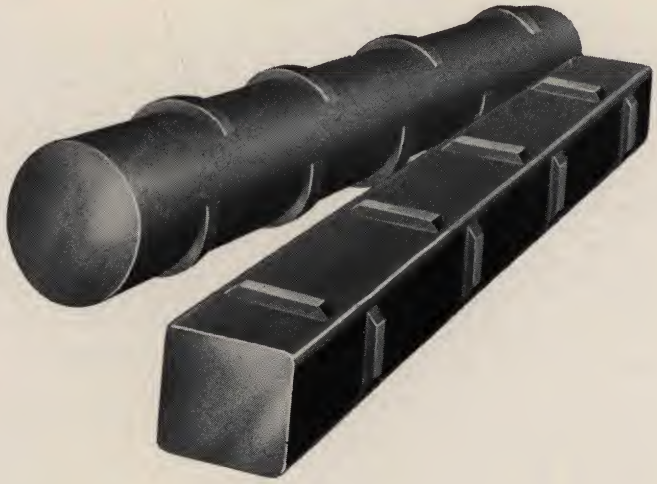
Place 10-gauge Ceco galvanized hook hangers 3½″ long at 4″ to 5″ centers in the bottom of all the joists. 5/32″ holes for the reception of hook hangers are drilled in the soffit boards, so that the forms may be readily removed, leaving the hook hangers projecting 1½″ beneath the bottom of the concrete joists.

⅜″ rib lath shall then be applied with the ribs against the concrete and the hook hangers clinched around the meshes of the rib lath.

Beneath 30″ Wide Meyer Steelforms

Place 10-gauge Ceco galvanized hook hangers 3½″ long at 4″ to 5″ centers in the bottom of all joists. 5/32″ holes for the reception of hook hangers are drilled in the soffit boards so that the forms may be readily removed, leaving the hook hangers projecting 1½″ beneath the bottom of the concrete joists. Also place No. 10-gauge soft galvanized wire hangers through the top surface of each steelform (holes in the steelforms are provided) at 3′ centers, providing a loop in each hanger to engage the concrete. ¾″ Ceco furring channels will then be erected running parallel to and between the rows of joists at approximately 3′ on centers. ⅜″ rib lath shall then be applied with ribs against the concrete, and supported alternately by channels and hook hangers at approximately 18″ centers. Tying of the lath to the channels shall be done with 18-gauge soft galvanized wire.

Ceco Reinforcing Bars



Ceco Reinforcing Bars are rolled from new billet steel. The deformations on the bars are at right angles to the main axis of the bar, and thus provide the most positive kind of mechanical bond to aid the adhesion of the concrete to the steel in resisting bond stresses existing in reinforced concrete members.

Upon the recommendation of the United States Department of Commerce, only those sizes of deformed reinforcing bars shown in the accompanying table are regularly rolled by the steel mills and carried in stock by the leading distributors of reinforcing bars.

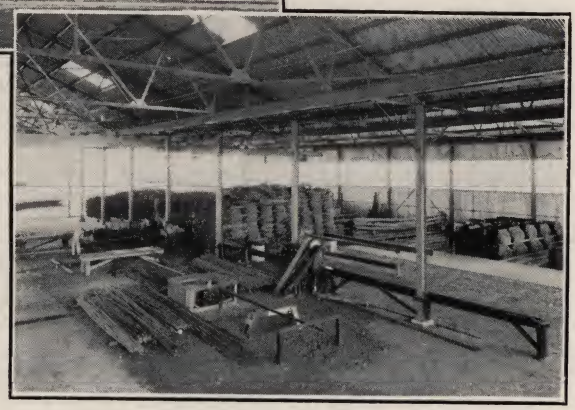
Reinforcing bars re-rolled from steel rails are used in some localities. This type of bar is available at our warehouses in the deformed section and can be furnished promptly, cut to length and bent, or in stock lengths.

Where the nature of the order permits it, shipments may be made direct from the mill in carload lots, or in any quantity, immediately, from our warehouse stocks.

Ordinary building operations demand a service which the mills rolling reinforcing bars cannot meet. Quantity production of steel tonnage forms the basis for economical mill operation. It would be impracticable for a mill to roll the reinforcing bars required for each building job separately from

In the accompanying photographs may be seen the modern handling and warehousing equipment in a typical Ceco Warehouse.

The use of Ceco Service eliminates the possibility of annoyance, trouble and delay in the installation of reinforcing steel.



all other orders. The frequent changing of the rolls necessary would halt the operation of the mill, and the handling incident to cutting to miscellaneous lengths would slow down the whole process.

Large steel mills, therefore, operate efficiently only when rolling each size of bar in quantities, and to a uniform length. Mill rolling schedules, moreover, are fixed in advance, and the interval between successive rollings of any particular size of bar may vary from two to four weeks, depending upon the accumulation of orders.

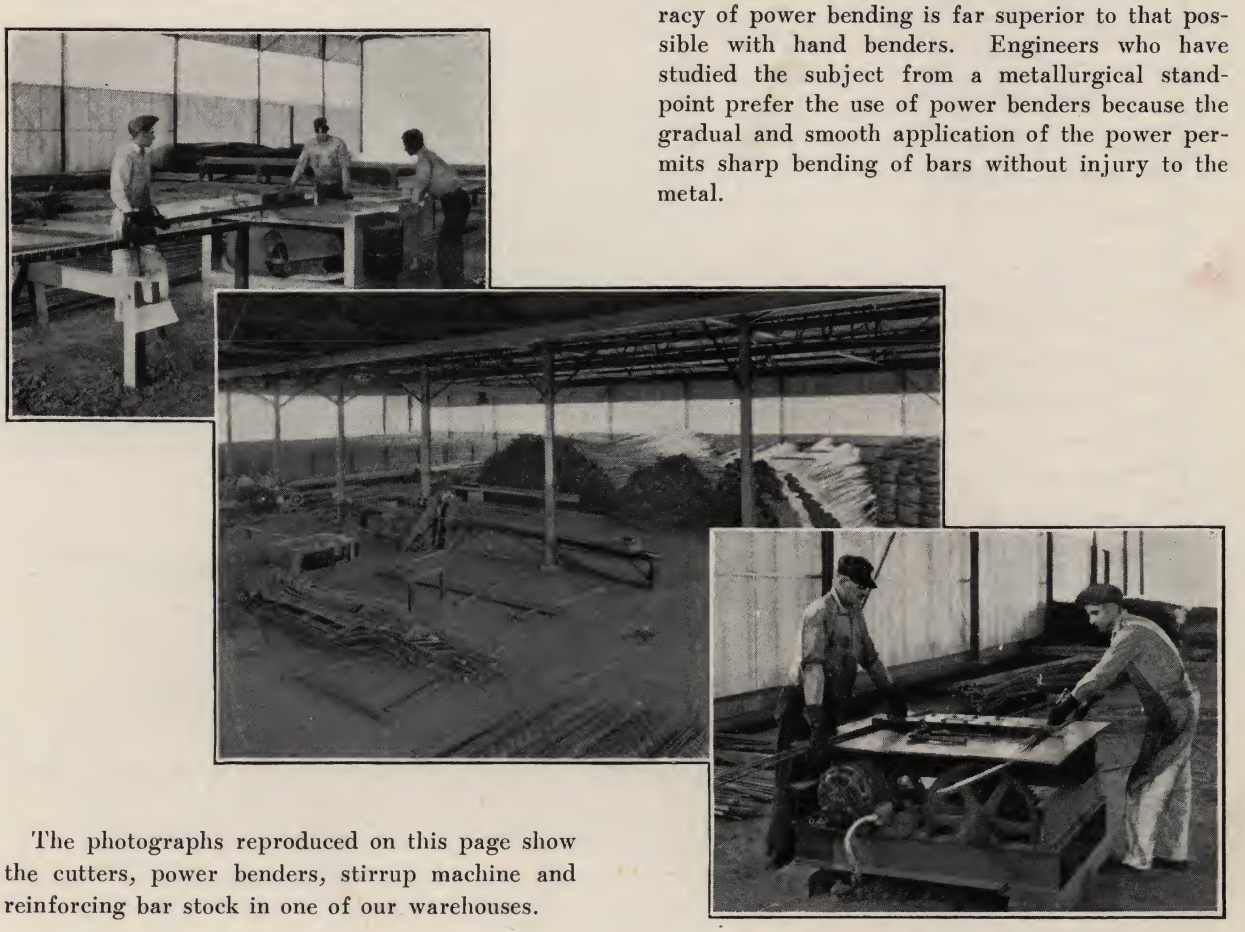
Ceco Steel Products Corporation warehouse service bridges the gap between the steel mill and the building operation. Large stocks of deformed reinforcing bars in the eleven standard sizes are maintained in all our warehouses. These warehouses are equipped with cutting shears, power benders, and handling devices which permit them to cut, bend, bundle, and tag the myriad lengths and bends of bars required for a reinforced concrete building, and to ship or deliver the steel to the job exactly when needed, and in the manner best suited for speedy installation. Ceco warehouse service reduces to a minimum the possibility of a delay to a building project on account of the reinforcing steel.

Standard Sizes of Ceco Reinforcing Bars

Size	Area	Weight	Size	Area	Weight
1/4" Round	.05	.167	7/8" Round	.60	2.044
3/8" Round	.11	.376	1" Round	.79	2.670
1/2" Round	.20	.668	1" Square	1.00	3.400
1/2" Square	.25	.850	1 1/8" Square	1.27	4.303
5/8" Round	.31	1.043	1 1/4" Square	1.56	5.313
3/4" Round	.44	1.502			

The cross-sectional areas listed above conform to the Industry's Simplified Practice Recommendation No. R26-30—Steel Reinforcing Bars—as issued by the United States Department of Commerce.

Power machines are used for bending slab and beam bars, stirrups, and column ties. The accuracy of power bending is far superior to that possible with hand benders. Engineers who have studied the subject from a metallurgical standpoint prefer the use of power benders because the gradual and smooth application of the power permits sharp bending of bars without injury to the metal.



The photographs reproduced on this page show the cutters, power benders, stirrup machine and reinforcing bar stock in one of our warehouses.

Ceco Column Spirals

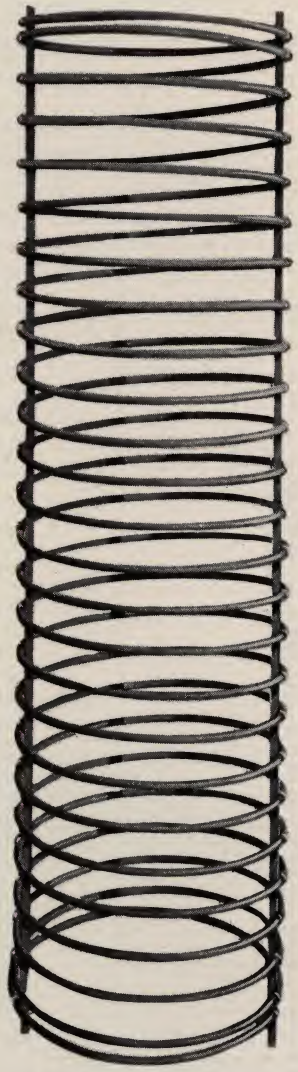
Ceco Column Spirals are fabricated in our own warehouses where there are always maintained ample stocks of wire in coils and channel spacers. Although each order must be specially fabricated, our capacity is such that prompt shipment can always be made.

Ceco Column Spirals are accurately coiled to diameter by machinery, and held to the correct pitch by our slotted channel spacers. Thus each hoop is accurately spaced and held in place. Spirals may be collapsed for shipment, without distortion, and expanded readily upon reaching the building site. Attention is called to the fact that spirals combining a heavy wire and a small diameter are collapsed with difficulty. Spirals can be coiled to any diameter from 8″ to 48″.

Ordinarily two spacers are furnished with each spiral and these are sufficient to firmly hold the spiral to the diameter and pitch designed, but additional spacers can be furnished if desired.

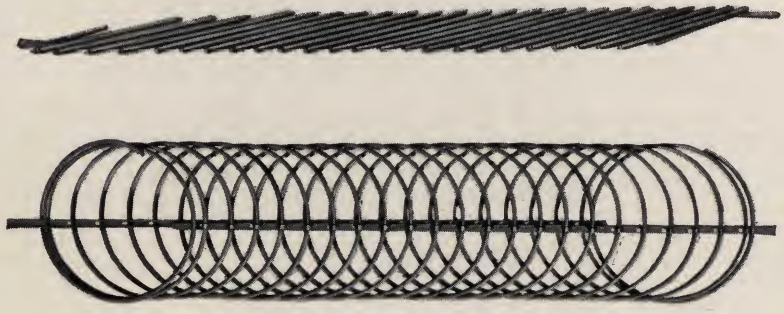
Coils of wire are carried in stock in the following sizes: 1/4″, 3/8″, 1/2″ and 5/8″. Three quarter inch hot rolled Channel Spacers are used where the wire does not exceed 3/8″. One inch Channel Spacers are used where the wire exceeds 3/8″.

On the next page there is given a table of weights of spirals of various diameters, pitches, and sizes of wire.



View of Ceco Column spiral set up ready for installation

View of section of one of our spiral fabricating plants showing Column Spirals in the process of manufacture.



Views of Ceco Column Spirals collapsed showing how compactly they can be shipped. This assures protection against damage.

WEIGHTS OF CECO SPIRALS EXCLUSIVE OF SPACERS

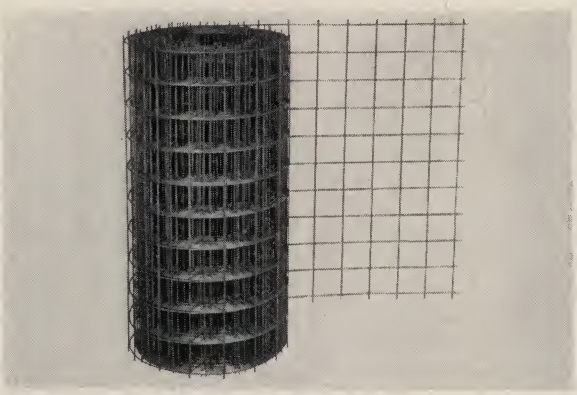
Size of Wire	Pitch of Wire	Diameter of Spiral 8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	Pitch of Wire	Size of Wire
1/4"	3"	1.40	1.57	1.75	1.92	2.10	2.27																																			3"	
	2 3/4"	1.53	1.72	1.91	2.10	2.29	2.48	2.67																																		2 3/4"	
	2 1/2"	1.68	1.89	2.10	2.31	2.52	2.73	2.94	3.15																																	2 1/2"	
	2 1/4"	1.87	2.10	2.33	2.56	2.80	3.03	3.26	3.50	3.73	3.96																															2 1/4"	1" 4
	2"	2.10	2.36	2.62	2.89	3.15	3.41	3.67	3.93	4.20	4.46	4.72	4.98																													2"	
	1 3/4"	2.40	2.70	3.00	3.30	3.60	3.90	4.20	4.50	4.80	5.10	5.40	5.70	6.00	6.30	6.60																										1 3/4"	
	1 1/2"	2.80	3.15	3.50	3.85	4.20	4.55	4.90	5.25	5.60	5.95	6.30	6.65	7.00	7.35	7.69	8.04	8.39	8.74	9.10																						1 1/2"	
	1 1/4"	3.35	3.77	4.19	4.61	5.02	5.44	5.86	6.27	6.70	7.12	7.53	7.95	8.37	8.78	9.21	9.63	10.1	10.5	10.9	11.3	11.7	12.1	12.6	13.0																	1 1/4"	
3/8"	3"	3.13	3.53	3.94	4.33	4.72	5.12	5.51	5.91	6.30	6.69	7.09	7.48	7.87	8.27	8.66	9.05	9.45	9.84	10.2	10.6	11.0	11.4																			3"	
	2 3/4"	3.42	3.85	4.27	4.72	5.15	5.58	6.01	6.44	6.87	7.30	7.73	8.16	8.59	9.02	9.45	9.88	10.3	10.7	11.2	11.6	12.0	12.5	12.9	13.3	13.7																2 3/4"	
	2 1/2"		4.23	4.70	5.17	5.67	6.14	6.61	7.09	7.56	8.03	8.50	8.98	9.46	9.92	10.4	10.9	11.3	11.8	12.3	12.8	13.2	13.7	14.2	14.6	15.1	15.6	16.1	16.5	17.0												2 1/2"	
	2 1/4"			5.23	5.75	6.28	6.82	7.35	7.87	8.40	8.92	9.45	9.97	10.5	11.0	11.5	12.1	12.6	13.1	13.6	14.2	14.7	15.2	15.7	16.3	16.8	17.3	17.8	18.4	18.9	19.4	19.9	20.5										2 1/4"	3" 8
	2"				6.47	7.06	7.65	8.25	8.86	9.45	10.0	10.6	11.2	11.8	12.4	13.0	13.6	14.2	14.8	15.4	15.9	16.5	17.1	17.7	18.3	18.9	19.5	20.1	20.7	21.3	21.9	22.4	23.0	23.5	24.2	24.8	25.4	26.0					2"	
	1 3/4"						8.75	9.42	10.1	10.8	11.5	12.1	12.8	13.5	14.2	14.8	15.5	16.2	16.9	17.5	18.2	18.9	19.6	20.2	20.9	21.6	22.3	22.9	23.6	24.3	25.0	25.6	26.3	27.0	27.7	28.3	29.0	29.7	30.4	31.0	31.7	1 3/4"	
	1 1/2"								11.8	12.6	13.4	14.2	14.9	15.7	16.5	17.3	18.1	18.9	19.7	20.5	21.3	22.0	22.8	23.6	24.4	25.2	26.0	26.8	27.6	28.3	29.1	29.9	30.7	31.5	32.3	33.1	33.9	34.6	35.4	36.2	37.0	1 1/2"	
1/2"	3"						9.08	9.80	10.5	11.2	11.9	12.6	13.3	14.0	14.7	15.4	16.1	16.8	17.5	18.2	18.9	19.6	20.3	21.0	21.7	22.4	23.1	23.8	24.5	25.2	25.9	26.6	27.3	28.0	28.7	29.4	30.1	30.8	31.5	32.2	32.9	3"	
	2 3/4"							10.7	11.4	12.2	13.0	13.7	14.5	15.3	16.0	16.8	17.6	18.3	19.1	19.8	20.6	21.4	22.1	22.9	23.7	24.4	25.2	25.9	26.7	27.5	28.2	29.0	29.8	30.5	31.3	32.1	32.8	33.6	34.3	35.1	35.9	2 3/4"	
	2 1/2"									13.4	14.3	15.1	16.0	16.8	17.6	18.5	19.3	20.1	21.0	21.8	22.7	23.5	24.3	25.2	26.0	26.9	27.7	28.5	29.4	30.2	31.1	31.9	32.7	33.6	34.4	35.3	36.1	36.9	37.8	38.6	39.5	2 1/2"	
	2 1/4"											16.8	17.7	18.6	19.6	20.5	21.5	22.4	23.3	24.2	25.2	26.1	27.0	28.0	28.9	29.8	30.8	31.7	32.6	33.6	34.5	35.4	36.4	37.3	38.2	39.2	40.1	41.0	42.0	42.9	43.8	2 1/4"	1" 2
	2"													21.0	22.0	23.1	24.1	25.2	26.2	27.3	28.3	29.4	30.4	31.5	32.5	33.6	34.6	35.7	36.7	37.8	38.8	39.9	40.9	42.0	43.0	44.1	45.1	46.2	47.2	48.3	49.3	2"	
	1 3/4"																27.6	28.8	30.0	31.2	32.4	33.6	34.8	36.0	37.2	38.4	39.6	40.8	42.0	43.2	44.4	45.6	46.8	47.9	49.1	50.3	51.5	52.6	53.8	55.0	56.2	1 3/4"	
	1 1/2"																			36.4	37.8	39.2	40.6	42.0	43.3	44.7	46.1	47.6	48.9	50.4	51.8	53.2	54.6	55.8	57.2	58.6	60.0	61.4	62.8	64.2	65.6	1 1/2"	
5/8"	3"														23.0	24.1	25.2	26.3	27.4	28.4	29.5	30.6	31.7	32.8	33.9	35.0	36.0	37.1	38.2	39.3	40.4	41.5	42.6	43.7	44.8	45.9	47.0	48.1	49.2	50.2	51.3	3"	
	2 3/4"																27.4	28.6	29.8	31.0	32.2	33.4	34.6	35.7	37.0	38.1	39.3	40.5	41.7	42.9	44.1	45.3	46.5	47.7	48.9	50.0	51.2	52.4	53.6	54.8	56.0	2 3/4"	
	2 1/2"																		32.8	34.2	35.5	36.8	38.1	39.4	40.8	42.2	43.3	44.6	45.9	47.2	48.5	49.8	51.1	52.4	53.7	55.0	56.4	57.7	59.0	60.3	61.6	2 1/2"	
	2 1/4"																					40.8	42.2	43.8	45.3	46.7	48.2	49.7	51.2	52.4	53.9	55.3	56.8	58.2	59.7	61.2	62.6	64.1	65.5	67.0	68.4	2 1/4"	5" 8
	2"																								50.9	52.6	54.2	55.9	57.5	59.2	60.8	62.4	64.1	65.8	67.2	68.8	70.4	72.1	73.7	75.4	77.0	2"	
	1 3/4"																												65.7	67.6	69.5	71.3	73.2	75.2	76.9	78.8	80.7	82.6	84.5	86.4	88.3	1 3/4"	
	1 1/2"																																	89.8	92.0	94.2	96.5	98.6	101	103	1 1/2"	

Spiral weights are for one lineal foot.

For 1/4" and 3/8" wire use 3/4" L spacers weighing 0.3 lbs. per. ft. each.
For 1/2" and 5/8" wire use 1" L spacers weighing 0.4 lbs. per ft. each.

2 spacers reqd. to 18" dia.
3 to 32" and 4 above 32"

Ceco Welded Fabric



Wire fabric provides an ideal reinforcement for the thin slab over Meyer Steelforms, as well as in all other cases where light reinforcement and close spacing of rods is required. It makes an excellent reinforcement for the concrete fireproofing of structural steel beams and columns.

A reinforcement is necessary for sidewalks, driveways, filling station approaches, reservoirs, swimming pool slabs, etc., whether on natural or filled ground to distribute concentrated loads and to prevent cracking due to temperature changes.

Wire fabric is especially adapted for use in reinforcing roads and pavements, and other slabs resting on the ground. The high yield point of cold drawn wire from which the fabric is made provides a reserve strength much needed in roadway slabs where the stresses resulting from unusual loads cannot be accurately predetermined.

Ceco Welded Fabric is manufactured from wire having a yield point of from 70,000 to 85,000 lbs. per square inch.

The fabric is of plain wire (unless specifically ordered galvanized). It is a well known fact that steel thoroughly embedded in a proper mixture of concrete does not rust. A thin coating of rust on steel to be used as reinforcement is actually desirable provided the rust is not in the form of a scale. The rust provides a rougher surface, and therefore a better bond.

Ceco Electrically Welded Fabric is a square or rectangular mesh made from cold drawn steel wire electrically welded at the intersections of the transverse and longitudinal wires. There is an absolute rigid connection with every joint which is the result of the electric welding or fusing together of the wires of the fabric.

There is no loss of tensile strength to the wires in the fabric either longitudinally or transversely. This is due to the fact that the welding actually fuses the wires together, making the joint a homogeneous section.

Ceco Electrically Welded Fabric is furnished in a wide variety of spacings and gauges. It varies from the lightest to the heaviest limits of manufacturing. Where equal reinforcing is desired Ceco Welded Fabric is available with cross sectional area equal in both directions.

The weights given in the accompanying tables are based on a width of fabric as measured from center to center of outside longitudinal wires. Square footage is also based on a width that is exclusive of the overhang of the cross wires outside the longitudinals.

The styles of mesh shown are those generally used, but any combination of wire sizes and spacing of longitudinal and cross wires may be furnished if desired and without delay. Longitudinals may be spaced 2″, 3″, 4″, 6″ 8″ and 12″ apart, and cross wires 2″, 3″, 4″, 6″, 8″, 12″ and 16″ apart.

Although fabric is ordinarily furnished in rolls for building work, it can be furnished straightened and cut to length if so desired.

STYLE	Spacing		Gauge of Wire		Sec. Area Sq. In. per Lin. Ft.		Weight per 100 Square Feet
	Longitudinal	Transverse	Longitudinal	Transverse	Longitudinal	Transverse	
22 1414	2″	2″	14	14	.030	.030	21
22 1313	2″	2″	13	13	.040	.040	28
22 1212	2″	2″	12	12	.052	.052	37
33 1414	3″	3″	14	14	.020	.020	14
33 1212	3″	3″	12	12	.035	.035	25
33 1010	3″	3″	10	10	.057	.057	41
44 1414	4″	4″	14	14	.015	.015	11
44 1313	4″	4″	13	13	.020	.020	14
44 1212	4″	4″	12	12	.026	.026	19
44 1010	4″	4″	10	10	.043	.043	31
44 88	4″	4″	8	8	.062	.062	44
44 66	4″	4″	6	6	.087	.087	62
44 44	4″	4″	4	4	.120	.120	85
66 1212	6″	6″	12	12	.017	.017	13
66 1010	6″	6″	10	10	.029	.029	21
66 99	6″	6″	9	9	.035	.035	25
66 88	6″	6″	8	8	.041	.041	30
66 77	6″	6″	7	7	.049	.049	36
66 66	6″	6″	6	6	.058	.058	42
66 55	6″	6″	5	5	.067	.067	49
66 44	6″	6″	4	4	.080	.080	58
216 711	2″	16″	7	11	.148	.008	55
216 610	2″	16″	6	10	.174	.011	65
216 510	2″	16″	5	10	.202	.011	75
216 49	2″	16″	4	9	.239	.013	89
316 711	3″	16″	7	11	.098	.009	38
316 610	3″	16″	6	10	.116	.011	45
316 510	3″	16″	5	10	.135	.011	52
316 49	3″	16″	4	9	.160	.013	61
48 1313	4″	8″	13	13	.020	.010	11
48 1214	4″	8″	12	14	.026	.008	12
48 1212	4″	8″	12	12	.026	.013	14
48 1112	4″	8″	11	12	.034	.013	17
48 1012	4″	8″	10	12	.043	.013	20
48 912	4″	8″	9	12	.052	.013	23
48 812	4″	8″	8	12	.062	.013	27
48 711	4″	8″	7	11	.074	.017	33
412 1212	4″	12″	12	12	.026	.009	13
412 1112	4″	12″	11	12	.034	.009	16
412 1012	4″	12″	10	12	.043	.009	19
412 912	4″	12″	9	12	.052	.009	22
412 812	4″	12″	8	12	.062	.009	26
412 711	4″	12″	7	11	.074	.011	31
412 610	4″	12″	6	10	.087	.014	37
412 510	4″	12″	5	10	.101	.014	42
416 711	4″	16″	7	11	.074	.008	30
416 610	4″	16″	6	10	.087	.011	35
416 510	4″	16″	5	10	.101	.011	40
416 49	4″	16″	4	9	.120	.013	48
416 38	4″	16″	3	8	.140	.015	56

Ceco Bar Chairs, Spacers and Accessories

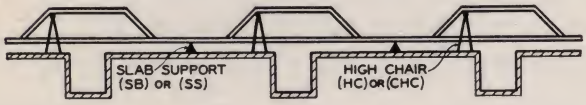
Bar supports and spacers are specified, recommended and accepted as necessary for the proper support and spacing of reinforcing steel. They provide and maintain accuracy in pouring concrete, obtaining greater speed and lower costs in setting steel. Ceco bar chairs and spacers are designated in accordance with the standard nomenclature for bar chairs and spacers as adopted by the Concrete Reinforcing Steel Institute. The following listings and designations are from "The Manual of Standard Practice of Concrete Construction, 1939 Edition as published by the Concrete Reinforcing Steel Institute."

Specifications For Placing Accessories

Bar supports are to be sufficient in number and sufficiently heavy to properly carry the steel they support. The wire sizes and number of supports shall not be less than the following:

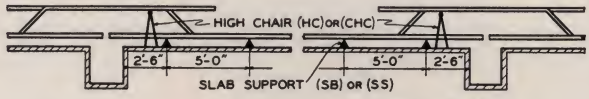
One Way Slab Construction

Bars continuous over more than one panel.



Beam spacing more than 6′-0″ use 2 supports.

Bars not continuous.



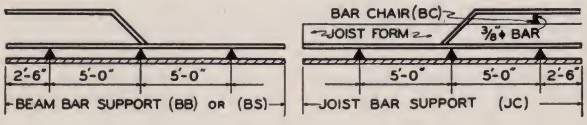
Slab Supports—End Spacing 2′-6″ Maximum. Maximum Intermediate Spacing 5′-0″.

Individual High Chairs—(HC)—spaced not more than 4′-0″ centers with not less than ⅝″ support bars. Continuous High Chairs—(CHC)—may be substituted for High Chairs and ⅝″ support bar.

Joist - Beam - Girder Construction

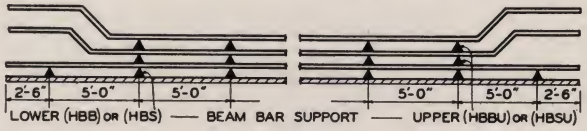
Beam and Joist Construction

Beam bars 1 inch square and smaller.



Heavy Beam and Girder Construction

Beam or Girder with bars larger than 1 inch.

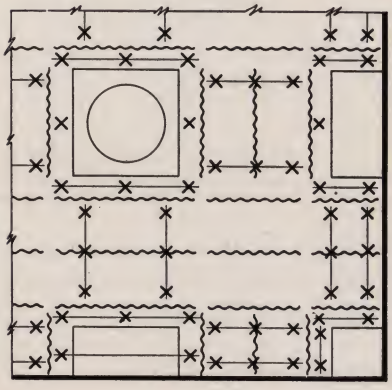


Maximum end spacing 2′-6″—Maximum intermediate spacing 5′-0″ for both lower and upper layers.

To support ends of bent bars in joists, use ⅜″ round bar at each side of and parallel to supporting beam or wall, held above form by individual chairs—(BC)—spaced approximately 25″ on centers.

Flat Slab Construction

Four Way



~~~~~ Designates Slab Supports (SB) or (SS).

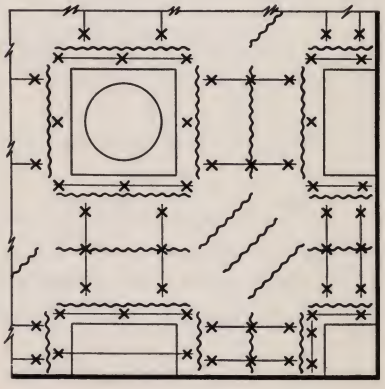
———— Designates ⅝″ Support Bar.

X— Designates High Chairs—(HC).

Slab Supports—For spans over 24′-0″ use 4 slab supports where 3 are shown on diagram.

Continuous High Chairs—(CH C)—May be substituted for High Chairs and ⅝″ support bars.

Two Way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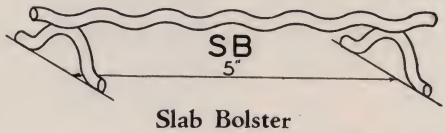
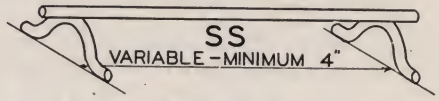
Accessory Specifications and Standard Nomenclature

Reprinted from "A Manual of Standard Practice for Reinforced Concrete Construction" 1939 Edition. Published by the CONCRETE REINFORCING STEEL INSTITUTE

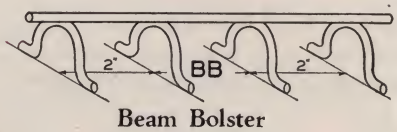
Wire Specifications — Standard Bright Basic Wire



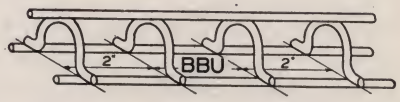
Slab Bolster



Slab Spacer

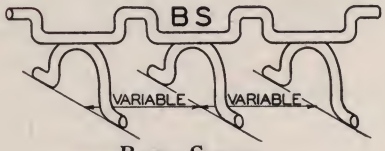


Beam Bolster

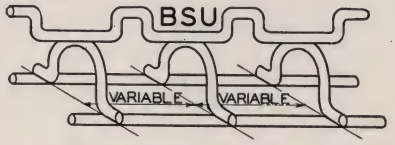


Beam Bolster Upper

Heavy Beam Bolster is Designated by HBB & HBBU

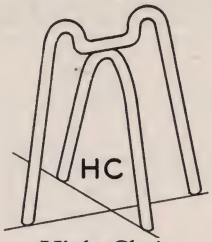


Beam Spacer

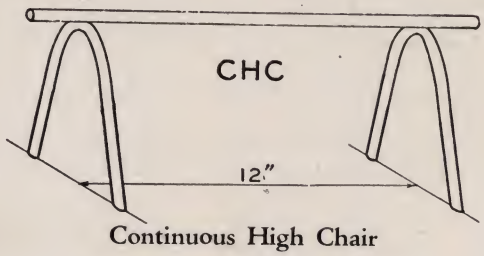


Beam Spacer Upper

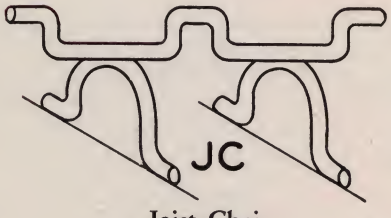
Heavy Beam Spacer is Designated by HBS & HBSU



High Chair



Continuous High Chair



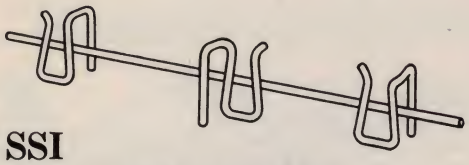
Joist Chair

Bar Chair

Above types of legs are additional standard types

End bearing legs are not a standard type but are furnished when specified. This type of leg is designated by the suffix "A"—i.e., Slab Bolster with end bearing legs is "SBA."

Galvanized legs furnished, when required, for small additional charge

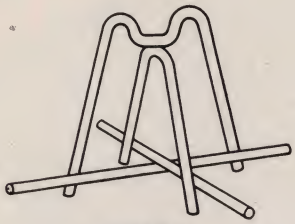


SSI

†Snap-In Slab Spacer

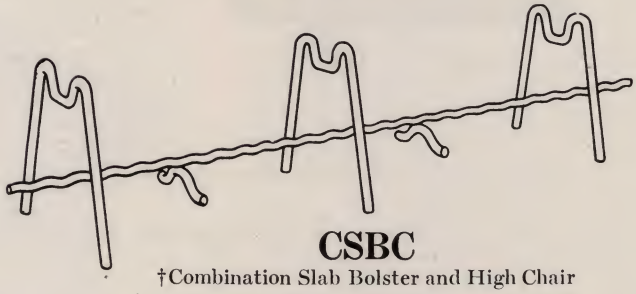
SBP

†Slab Bolster with Plate



SHC

†Special High Chair



CSBC

†Combination Slab Bolster and High Chair

Accessory Specifications and Standard Nomenclature

Symbol	Accessory	Top Wire*	Legs*	Description
SB	Slab Bolster	No. 4 Corrugated	¾" high--No. 7 over ¾"--No. 5	Legs spaced 5" centers—Corrugations vertical or flat spaced 1" centers—Heights up to 2". **Stocked in ¾", 1", 1½" heights and 5 and 10 foot lengths.**
SS	Slab Spacer	No. 5 Smooth	Same as SB	Legs spaced to provide supporting leg under each bar. Minimum leg spacing 4"—Heights up to 2". **Fabricated to order.**
BB	Beam Bolster	No. 7 Smooth	No. 7	All legs spaced 2" centers—Maximum height 3". **Stocked in 1", 1½", 2" heights, in 5 foot lengths.**
HBB	Heavy Beam Bolster	No. 4 Smooth	No. 4	Same as BB except maximum height 5".
BBU	Beam Bolster Upper	No. 7 Smooth	No. 7	All legs spaced 2" centers—Maximum height 3". **Stocked in 1", 1½", 2" heights, in 5 foot lengths.**
HBBU	Heavy Beam Bolster Upper	No. 4 Smooth	No. 4	Same as BBU except maximum height 5". **Fabricated to order.**
BS	Beam Spacer	No. 7 Smooth	No. 7	Fabricated to order for desired bar spacing and beam width—Maximum height 3".
HBS	Heavy Beam Spacer	No. 4 Smooth	No. 4	Same as BS except maximum height 5".
BSU	Beam Spacer Upper	No. 7 Smooth	No. 7	Fabricated to order for desired bar spacing and beam width—Maximum height 3".
HBSU	Heavy Beam Spacer Upper	No. 4 Smooth	No. 4	Same as BSU except maximum height 5".
JC	Joist Chair	No. 8	No. 8	**Made and stocked only in 4, 5, 6 inch widths and ¾", 1", 1½" heights.**
BC	Bar Chair	No. 8	No. 8	**Made and stocked only in ¾", 1", 1½" and 2" heights.**
HC	Individual High Chairs	No. 5	No. 5	For heights over 2" to 6"—For heights over 6" use No. 0 wire. **Stocked in ¼" increments from 2¼" to 6".**
CHC	Continuous High Chairs	No. 0	No. 0	All legs 12" centers—No. 4 wire legs for heights up to 6". **Fabricated to order.**
† SSI	Snap-in Slab Spacer	No. 4 Smooth	No. 6 Special	For ⅜", ½" and ⅝" bars. Heights ½", ¾", 1". **Fabricated to order.**
† SBP	Slab Bolster with Plate	Same as SB	Same as SB	Plate is 20 gauge, 2¾" wide. Plate also applied to SS, BB, HBB, BS and HBS. **Fabricated to order.**
† SHC	Special High Chair	Same as HC	Same as HC	Cross wires of No. 0 gauge. **Fabricated to order.**
† CSBC	Combination SB and HC	Same as SB	Same as HC and SB	High and low legs 10" on center, alternating. **Fabricated to order.**

* W&M wire gauges indicated in this table are the minimum sizes to be used.
† — Not included in standard specifications and nomenclature.

Plain Bar Ties

These ties are instantly snapped into place on the reinforcing bars, giving a quicker, better, and more economical method of tying. Suitable for tying the following combination of intersecting bars whether rounds, squares, square twisted or deformed, or any combination of one style with another. If bars are square or twisted figure combined diameter ¼" more than the actual size.

Size No. 0. For tying two intersecting bars as follows: ¼" x ¼", ¼" x ⅜", ⅜" x ⅜".

Size No. 1. For tying two intersecting bars, the combined diameter of which is not less than ⅝" nor greater than 1".

Size No. 2. For tying two intersecting bars, the combined diameter of which is not less than 1" nor greater than 1⅜".

Size No. 3. For tying two intersecting bars, the combined diameter of which is not less than 1¼" nor more than 1⅝".

No. 0 ties are packed in cartons of 2,000 weighing 34 lbs.
No. 1 ties are packed in cartons of 2,000 weighing 45 lbs.
No. 2 ties are packed in cartons of 1,000 weighing 38 lbs.
No. 3 ties are packed in cartons of 1,000 weighing 63 lbs.

The ties are shipped in wooden boxes. No broken lots will be shipped.

Tie Chairs

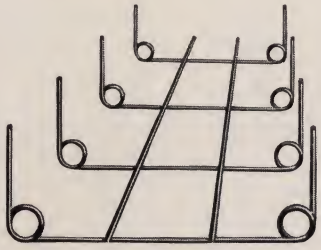
These tie chairs are similar to the plain bar tie with the exception that they not only tie the bars, but support them above the forms. There are only two sizes of chairs required for all combinations of bars, as follows:

Size No. 1. For tying and supporting any two intersecting bars, the combined diameter of which is not greater than 1".

Size No. 2. For tying and supporting any two intersecting bars, the combined diameter of which is not less than 1⅛" nor more than 1⅜".

Both sizes packed in wooden boxes of 500 each, weighing 38 lbs. No broken lots will be shipped.

Reed Soffit Clips



Where structural steel members are to be fireproofed with concrete, good practice demands that they be provided with some form of clip which will prevent failure of concrete along the lower flanges of such members. Reed Clips is the most simple and scientific manner to insure against failure. The cross members are offset 1" by loops, thereby furnishing a bond sufficient to thoroughly reinforce the concrete. One or more longitudinal wires hold the cross wires in place by welds. The cross wires do not project beyond the flange and therefore offer no obstruction in the placing of concrete, nor can they be dislodged by ramming and tamping.

Reed Clips are strongly made of No. 12 gauge wire electrically welded. They are light in weight, easily shipped and stored, and most easily applied. They permit the mechanic to keep his work ahead of him the entire length of the steel member.

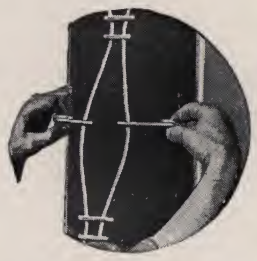
The worker never leaves his position for any one beam, girder, or column. He simply bends each clip over the flange and shoves the fabric ahead the required distance.

Reed Clips come in 5 ft. lengths with clipping members spaced 12" apart. One or more longitudinal wires are used, depending on the width as follows:

Flange Width	Space of Clips	No. of Longitudinals	Length of Projecting Wires
3" to 8"	12"	1	2½"
9" to 15"	12"	2	4"
16" to 20"	12"	3	6"
21" to 26"	12"	4	6"

Reed Clips are shipped in well crated bundles of 5 ft. lengths and 250 ft. per bundle.

The Expansible Reed Clip



The Expansible Reed Clip retains all the features of the previously described type, and in addition provides even more reinforcing per lineal foot of flange, especially on the wider flange. There are two longitudinal wires on both sizes. As the clip is expanded to fit wider flanges it shortens in length and provides more reinforcement per lineal foot.

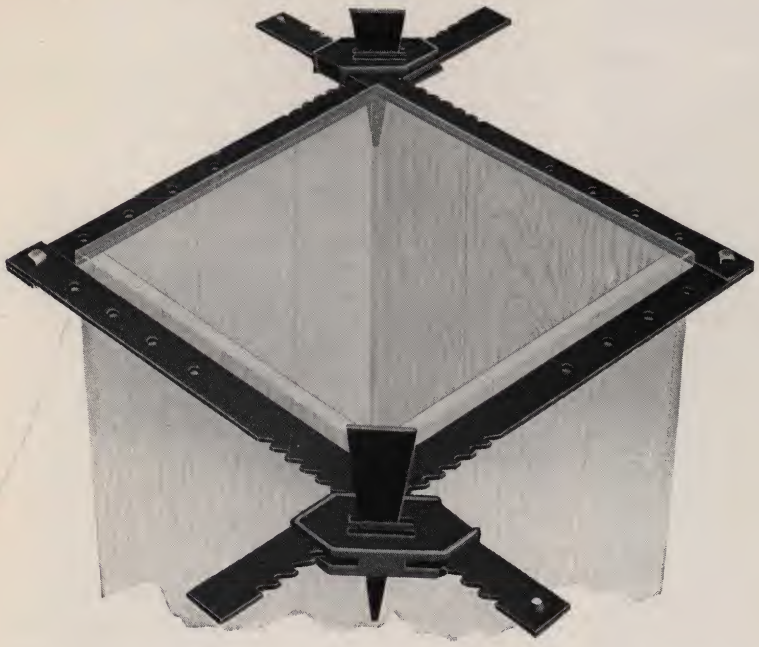
This clip is also made of No. 12 gauge hard galvanized steel wire electrically welded at every joint.

The main advantage of this type of clip is that only two sizes are required for all beams and columns, and in this way eliminates the necessity of ordering numerous widths to take care of the various sizes of beams and columns.

Size No. 1 is 4 inches wide and can be expanded to 12 inches wide. Stocked in 4 ft. lengths.

Size No. 2 is 8 inches wide and can be expanded to 18 inches wide. Stocked in 4½ ft. lengths.

Meyer Adjustable Column Clamps



There are five definite reasons why building contractors, in concrete construction work, are using Meyer All-Steel Adjustable Column Clamps for square or rectangular concrete column forms.

1. **Save Labor.** An entire column can be clamped in a fraction of the time needed to cut up and nail into place makeshift wooden clamps.
2. **Save Lumber.** Lumber cut up for wooden column clamps has a life of one or two uses and has no salvage value. Meyer All Steel Column Clamps are built for a life-time.
3. **Save Money.** Meyer Adjustable Column Clamps may be rented on a reasonable basis.
4. **Save Time.** Meyer Adjustable Column Clamps are applied quickly. They are assembled in two units and are removed by a sharp blow on the wedge.
5. **Avoid Trouble.** Meyer All Steel Clamps have many times the strength of wooden clamps. There is no danger of bursting column forms.

Meyer Adjustable Column Clamps are made entirely of high carbon steel. They are practical. These clamps consist of two units already assembled and ready to be applied, together with two steel wedges. There are two pairs of notched steel bars, hinged together with a bolt, two guide castings, and two wedges. The guide casting is held from slipping off the bar by a rivet on the end of the bar.

Meyer Adjustable Column Clamps are made in two sizes as follows:

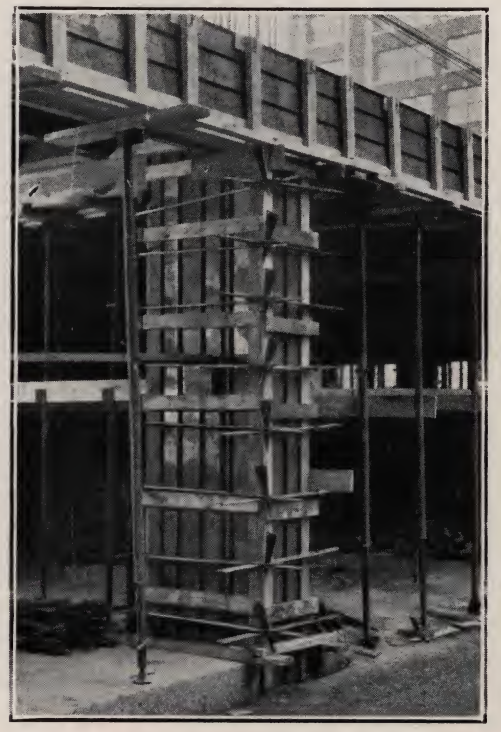
Style No.	Size of Members	Adjustability		Shipping Weight
		Using 1" lbr.	Using 2" lbr.	
1	$\frac{5}{16}$x2$\frac{1}{4}$x36"	for cols. 9 to 25"	for cols. 8 to 24"	35 lbs.
2	$\frac{5}{16}$x2$\frac{3}{4}$x50"	for cols. 15 to 37"	for cols. 14 to 36"	56 lbs.

They are easy to install. The practicability of any column clamp depends upon its ease of adjustment in the position necessary to hold the wood forms to the required column size, and at the same time to be absolutely leakproof and rigid.

The major adjustment is secured by means of holes spaced 4" apart beginning at one end of the bar and continuing almost to the middle, the two bars being hinged together through any of the holes, by means of a $\frac{1}{2}$" bolt for the No. 1 Clamp and a $\frac{5}{8}$" bolt for the No. 2 Clamp. The tapered wedge pin thrust through one of two available slots in the guide casting, engages the bars between the saw teeth, and readily makes the fine adjustment necessary to hold the bar arms firmly against the wood column box. The great number of teeth, however, eliminates the necessity of moving the hinge bolt for each change in size of column.

Once in place the clamp is enabled to take the full bursting pressure of the liquid concrete. Except to hold the form lumber in one piece, no wooden cleats of any kind are required; the steel clamps taking the full load.

The clamps are erected by two men, each driving a wedge in place at approximately the same time. To prevent any tendency towards distortion of the column forms the wedges should be put at alternate corners of the column on every other clamp. The removal of the clamps is simple. A sharp blow with a hammer dislodges the wedges and releases the clamp.



Meyer Adjustable Steel Shores

The use of Meyer Adjustable Steel Shores represents a distinct advance in the art of constructing the form work for reinforced concrete buildings.

The same basic reasons for the savings in labor and material apply both to the use of Meyer Steelforms and Meyer Adjustable Steel Shores. For many years contractors have realized that concrete joists could best be formed with Steelforms, and today wood is rarely used for that purpose. Equally potent are the reasons for the use of Meyer Adjustable Steel Shores.

In the past, 4 by 4's have been largely used as the vertical members in concrete formwork. Such members, while possessing great strength, leave much to be desired from the practical standpoint. In the first place, building story heights vary greatly so that the uprights are in a constant state of being cut and spliced as they are re-used. Only a few uses reduce the 4 by 4's to lengths so short as to be valueless for formwork. Also, it is unfortunate that 4 by 4's can seldom be used elsewhere in the building, and have little salvage value. Built-up Tee sections of 2 by 4's and 2 by 6's involve additional labor to offset their increased salvage value.

Not only is the labor of cutting, splicing, and fitting a major labor item, but there is also an important labor cost in the cutting and installation of wedges to bring the shores to exactly the right height.

The Meyer Adjustable Steel Shore provides the solution for each of these objectionable features; it is a practical and scientific substitute for what has previously been a make-shift, expensive, and generally unsatisfactory method for taking care of one of the most costly parts of the formwork.

The Meyer Adjustable Steel Shore is an all metal shore, handled on a rental basis, durable, with a firm seat for the supported ledgers, adjustable throughout the range of heights ordinarily found on building jobs, and with a hair line adjustment of height attained with unbelievable speed and ease by means of a screw jack base.

There is an additional economy when Meyer Adjustable Steel Shores are used in supporting beam forms. A short piece of 4 by 4 nailed through the angle head forms a Tee head shore at practically no additional cost over that of an ordinary shore.

The Meyer Adjustable Shore is all metal, and complete in itself ready for use. No wood mem-

Recommended Maximum Loads For Meyer Adjustable Shores

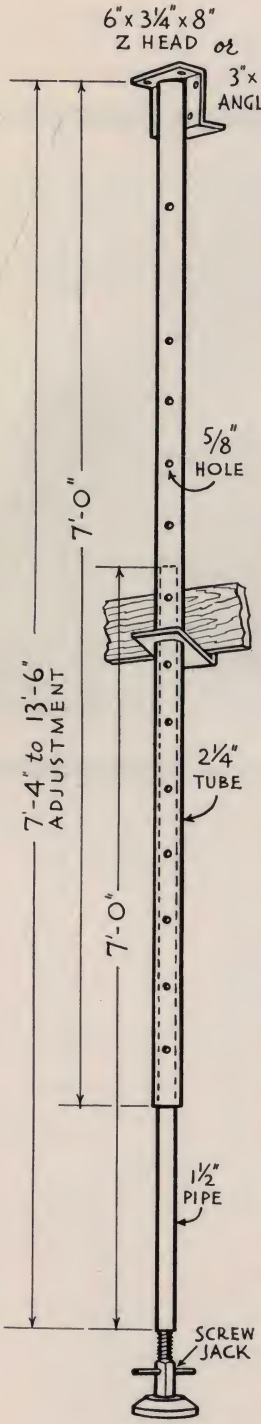
Shores with load applied directly on top.

HEIGHT	LOAD
With Cross Bracing, 7′4″ to 13′6″	5,000 lbs.
Without Cross Bracing,	
Up to 8′0″	5,000 lbs.
8′0″ to 9′0″	4,000 lbs.
9′0″ to 10′0″	3,000 lbs.
10′0″ to 11′0″	2,000 lbs.
Above 11′0″ Shore must be Rigidly Braced.	5,000 lbs.

Shores with load applied to Lower Flange of Z Bar Head, (Eccentrically Loaded)

HEIGHT	LOAD
With Cross Bracing, 7′4″ to 13′6″	3,500 lbs.
Without Cross Bracing,	
Up to 8′0″	3,500 lbs.
8′0″ to 9′0″	3,000 lbs.
9′0″ to 10′0″	2,000 lbs.
Above 10′0″ Shore must be Rigidly Braced.	3,500 lbs.

bers of any kind are required to complete it or extend it. A Meyer Adjustable Shore consists of a 1½" steel pipe with a screw jack base and a 2¼" steel tube with an angle or Z bar welded to the head. The pipe slides in the tube, and is locked within 2" of the required height by means of a ⅝" bolt slipped through holes provided in both the pipe and the tube. In this way the approximate required height of the shore is quickly obtained. The adjustment to the exact height required is made with the convenient screw jack base.

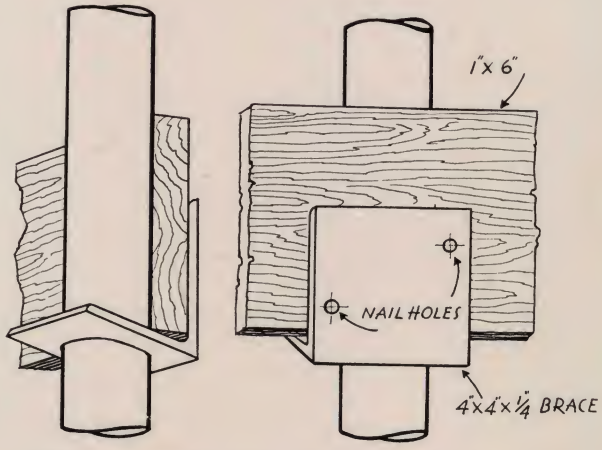


It is notable that both adjustments of the shore are positive; there is no dependence upon any gripping or frictional action which would render uncertain the carrying capacity of the shore. The mechanical advantage of the screw jack base is such that one man can perform the work necessary to lift the supported load in case of settlement, or can apply the load gradually when reshoring a green slab.

The Meyer Adjustable Shore (standard size) gives an adjustment from 7'-4" minimum to 13'-6" maximum, and within this range will come 90% of the requirements of all shoring.

Whenever the loading and height of the shores require bracing, this may be accomplished with 1" x 6" lumber held in place by means of an angle clip. A hole in one leg of the angle clip slightly larger than the diameter of the tube permits it to slide up and down the shore. Because the two legs of the angle are slightly less than 90 degrees apart, upon introduction of the 1"x6" cross brace the angle clip automatically clamps itself into position on the shore at any desired height. Nails driven into the cross braces through small holes in the vertical leg prevent the bracing from moving. The shore weighs 48 pounds complete.

The above picture shows manner in which Meyer Adjustable Steel Shores were double-decked to support forms 26 feet above ground level.



The above details show action of Angle Clip for cross bracing.

To meet increased demand for CECO Products, this new building has been added to our Chicago manufacturing plant. It houses improved facilities for the manufacture of CECO Metal Lath and Accessories, Steel Windows and Steel Joists.

Ceco